Developing a Framework for Successful Adoption and Effective Utilisation of ICT by SMEs in Developing Countries: a Case Study of Nigeria

Idisemi Apulu

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Developing a Framework for Successful Adoption and Effective Utilisation of ICT by SMEs in Developing Countries: a Case Study of Nigeria

By

Idisemi Apulu

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Department of Information Systems
University of Wolverhampton

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Signature: _____
Idisemi Apulu

Date: _____

ABSTRACT

In recent years there has been an increase in the adoption of Information and Communication Technology (ICT) in organisations, as the use of ICT causes some form of revolution in business practices. All over the world, ICT has greatly transformed the manner in which companies conduct business. However, there is considerable evidence to show that Small and Medium Sized Enterprises (SMEs) in developing countries, particularly those in Sub-Saharan Africa (SSA), are yet to reap the full benefits offered by ICT as compared to their counterparts in the developed countries. Although the contribution of SMEs' is of notable importance to many countries' economy, yet those in developing countries lag far behind.

For SMEs to survive and remain competitive in the current highly competitive business environment there is a need to adopt and use ICT effectively, in order to attain some level of competitive advantage. This research investigates factors affecting the adoption and effective utilisation of ICT, with particular emphasis on SMEs in Nigeria. It is presumed that SMEs' adoption of ICT in Nigeria will provide opportunities to accelerate the country's socio-economic growth as it will offer Nigeria the chance to 'leapfrog' some stages of development.

The methodology adopted in undertaking this study is the qualitative research approach although a survey was used at the initial stage, to provide an exploratory snapshot of the SMEs in context. This research has empirically identified key factors motivating ICT adoption in Nigerian SMEs, and benefits resulting from the use of ICT in their organisational performance. Factors affecting the adoption and effective utilisation of ICT in Nigerian SMEs were also identified. Following this, strategies were proposed which led to the development of a framework that will assist to increase the adoption and effective use of ICT amongst SMEs in Nigeria and also, aid the further deployment of more sophisticated ICT solutions by these SMEs.

The framework was validated via a survey and analysed with the aid of SPSS software. The findings obtained from the validation procedure indicated that the framework is valuable and suitable for use in practice since the research shows that the majority of respondents accepted the research findings and recommendations for success. This research offers recommendations that will assist the Nigerian government, stakeholders such as ISPs, as well as owners/managers of SMEs, in resolving the problems confronting SMEs in Nigeria.

DEDICATION

I dedicate this thesis to the Almighty God who granted me the grace and mercy to embark upon and complete this PhD.

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LIST OF ABBREVIATIONS

ADB – Agricultural Development Bank

BERR – Department of Business, Enterprise and Regulatory Reform

BOI – Bank of Industry

CEO – Chief Executive Officer

CPRCN – Computer Professional Registration Council of Nigeria

CRM - Customer Relationship Management

ERP – Enterprise Resource Planning

GDP – Gross Domestic Product

GSM – Global System for Mobile Communication

ICT - Information and Communication Technology

IDCs – Industrial Development Centres

IMF – International Monetary Fund

IPPs – Independent Power Plants

IS – Information Systems

ISPs – Internet Service Providers

ITU – International Telecommunication Unit

NACRDB – Nigerian Agricultural Co-operative and Rural Development Bank

NBCI – Nigerian Bank for Commerce and Industry

NCC – Nigerian Communications Commission

NDE – National Directorate of Employment

NERFUND – National Economic Reconstruction Fund

NEXIM – Nigerian Bank for Commerce and Industry

NIDB – Nigerian Industrial Development Bank

NITDA- National Information Technology Development Agency

NRI – Network Readiness Index

OECD – Organisation for Economic co-operation and Development

PC – Personal Computer

ROI – Return on Investment

SCM – Supply Chain Management

SME - Small and Medium Sized Enterprises

SMEDAN – Small and Medium Sized Agency of Nigeria

SMEIS – Small and Medium Equity Investment Scheme

SSA – Sub-Saharan Africa

SSICS – Small Scale Industries Credit Scheme

UNCTAD – United Nations Conference on Trade and Development

UNESCO – United Nations Educational, Scientific and Cultural Organisation

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CHAPTER ONE – INTRODUCTION

1.0 Introduction

Chapter one presents an overview of the research. It describes the research background and the research aim, research justification, the methodology adopted, significance of the research and the inadequacies of previous research from the literature reviewed. The chapter concludes with an outline of the thesis structure. In undertaking any research, it is important to establish the rationale behind such a study as this acts as a reference point against which the research outcomes can be evaluated. Therefore, chapter one serves as an overall introduction to the entire thesis.

1.1 Background of the Study

In recent years, the increase in the use of Information and Communication Technology (ICT) in organisations has significantly changed the manner in which organisations operate and communicate. ICT plays a crucial role in the present knowledge based economy and is applied in a wide range of areas in several organisations. The revolutions in the use of ICT have profound implications for economic and social development and have pervaded every aspect of human life (Shanker, 2008). Many organisations tend to rely heavily on ICT solutions in order to develop and grow their businesses (Asgarkhani and Young, 2010). According to Spanos et al. (2002), ICT has the ability to enhance, coordinate and control the operations of many organisations and can also increase the use of management systems such as Customer Relationship Management (CRM) amongst others. Therefore, ICT is regarded as a vital tool for the efficient administration of any organisation and in the delivery of services to its clients.

Ashrafi and Murtaza (2008) state that organisations around the globe are now utilising ICT not just for cutting costs and improving efficiency, but also for providing better customer service. Similarly Buhalis (2003), states that businesses can now interact more efficiently with the use of ICT. Sharing and disseminating information is a key role played by ICT which also assists in increasing the supply of information within organisations. According to Spanos et al. (2002), buyers and sellers are able to share information and transfer goods across national borders with the use of ICT, which helps to increase access to global supply chains. This brings about openness and transparency in organisations (Kollberg and Dreyer, 2006; Shanker, 2008).

Shanker (2008) further states that the use of ICT in many organisations has assisted in reducing transactional cost, overcoming the constraints of distance by cutting across geographic boundaries thus helping to improve coordination of activities within organisations. Jiménez-Zarco et al. (2006) also added that ICT plays an important role in acquiring, creating and managing knowledge as it enables the diffusion of organisational data that can be crucial for effective decision making and control at all levels. Likewise, ICT helps in organisational planning and improves organisational flexibility.

1.2 Definition of Terms

The key terms in this research are defined in sections 1.2.1 and 1.2.2 below.

1.2.1 Definition of ICT

ICT is defined as any technology that facilitates communication and assists in capturing, processing and transmitting information electronically (Apulu and Latham, 2009c). Mugodi and Flemming (2003) define ICT as "the goods and services that support the electronic display, processing, storage and transmission of information". Kawalek and Ramani (2007) refer to ICT as a broad term that is used to describe any technology from simple acquisition of hardware to the full implementation of the system. ICTs are regarded as tools used for changing world values and making society a knowledge based environment where things are processed electronically (Hassan and Willie, 2006), and have a revolutionary impact on the manner in which organisations conduct businesses, how people see the world and how people live (Dabesaki, 2005). Gyampoh-Vidogah et al. (2007) describe ICT as the overall management and control of an organisation's investment in information including identifying and sharing management information and ensuring that standardisation, control, security and integrity of data are stored in a way that benefits a particular organisation. The World Bank (2004) further defines ICT as consisting of the hardware, software, networks and media for the collection, storage, processing, transmission and presentation of information in the form of voice, data, text and images.

Many researchers use the terms Information Technology (IT) and Information and Communication Technology (ICT) interchangeably; however, Ruiz-Mercader et al. (2006) describe IT as a means of convergence of computers, hardware, software, telecommunications, internet, electronics and the resulting technologies. This can be measured through the inventory of applications owned by organisations. E-Business

W@tch (2006) and Ion and Andreea (2008) state that ICT includes networks, computers and other data processing and transmitting equipment including software.

Nicol (2003) classifies ICT into three major categories:

1. Information technologies which covers computer hardware, software and peripherals such as printers, scanners and so on.
2. Telecommunications technologies which include fixed-line and mobile telephones and the broadcasting of radio and television, often through satellites, and
3. Networking technologies that are comprised of internet through a wide range of options such as broadband, dial up, Local Area Network (LAN), Wide Area Network (WAN) as well as websites, network security and satellite technologies.

This research adopts Beckinsale and Ram's (2006) as well as Mpofu et al.'s (2009) definitions of ICT which state that "ICT is any technology used to support information gathering, processing, distribution and use." In this research, ICT is also regarded as the application of software used to serve major business functions (Laudon and Laudon, 2004) including accounting and human resources software, customer relationship management (CRM) and supply chain management (SCM), internal IT usage such as internet and email as well as enterprise resource planning (ERP) that integrates all business functions into a single computer system. According to Manueli et al. (2007), ICT comprises different technologies such as computers, internet and websites as well as fixed-line telephones, mobile phones and other wireless communication devices, networks, broadband and various specialised devices.

Currently, modern ICTs such as software, mobile phones and associated applications such as 'VOIP' (transmitting telephone calls over the internet) have become available to many countries worldwide but the most rapid growth is in mobile phone usage (Parliamentary Office of Science and Technology, 2006; Apulu and Latham, 2009b). Likewise, many benefits have been attached to the adoption and use of ICT in organisations. At the moment, companies are undergoing extraordinary changes and are seeking new ways to "stand out" in order to sustain their competitive advantage. Hence, organisations including Small and Medium Sized Enterprises (SMEs) are relentlessly searching for new ways of creating and delivering value to customers with the use of ICT.

1.2.2 Definition of SMEs

The importance of Small and Medium Sized Enterprises (SMEs) cannot be overlooked in the economic development of any country since SMEs play a critical role in every country's economic development and Nigeria is no exception. The concept of SMEs is relative and dynamic. There is no universal definition of SMEs that is widely accepted as the definition is dynamic and depends largely on a country's level of development (Aruwa and Gugong, 2007; Mutula and Brakel, 2007). The definition of SMEs differs from one country to another but is often based on employment, assets or a combination of both. Jutla et al. (2002) state that SMEs have been defined against various criteria such as the value of assets employed and the use of energy. Rahman (2001) ascertains that SMEs are defined by a number of factors and criteria, such as location, size, age, structure, organisation, number of employees, sales volume, worth of assets, ownership, through innovation and technology. Storey (1994) added that the number of employees is considered to be an appropriate measure of SMEs because of the differences in organisational structure that occur with size. Aruwa and Gugong (2007) affirm that each country tends to derive its own definition based on the role SMEs are expected to play in that particular economy.

Varying definitions amongst countries may arise from differences in organisations at different levels of economic development. For example, the Department of Business, Enterprise and Regulatory Reform (BERR) (2009) uses the following definitions: Micro firm: 0-9 employees; Small firm: 0-49 employees; Medium firm: 50-249 employees; and Large firm: over 250 employees. The European Union Commission (2003) also defines SMEs, using the same number of employees as used by BERR, but includes annual turnover. Micro enterprises are those having fewer than 10 employees and having an annual turnover not exceeding €2 million or an annual balance sheet total not exceeding €2 million. Small enterprises employ fewer than 50 people and have either an annual turnover not exceeding €10 million or an annual balance sheet total not exceeding €10 million. Medium Sized Enterprises are those with fewer than 250 employees and have either an annual turnover not exceeding €43 million.

1.3 Research Scope and Motivations

The research scope and motivations for undertaking this study are summarised in the following sections.

1.3.1 Research Scope

The scope of this research focuses on SMEs in Nigeria. The research investigates factors that motivate and inhibit the adoption of ICT in some Nigerian SMEs and further determines the extent to which some of these SMEs that have successfully adopted ICT (adopters), effectively utilise sophisticated ICT applications/solutions/systems. The research also determines the impact of ICT on the selected SMEs' organisational performance. This research concentrates on SMEs since they play a vital role in the Nigerian economy and significantly contribute to the country's industrial development. Other researches that are similar to this have been conducted in countries such as South Africa, Kenya and Botswana.

1.3.2 Research Motivations

This research evolved as a result of the researcher's discontent from work experience which shows that there is low level of development amongst SMEs in Nigeria, since many of them still operate using traditionally-based approaches rather than adopting modern technologies. A number of weaknesses were identified in the research area which include the lack of a detailed report that identifies key factors affecting ICT adoption in Nigerian SMEs, factors that inhibit successful adopters from effectively utilising ICT, and also factors that affect ICT users from further adopting sophisticated ICT applications/systems.

In order to produce such a report, the following **objectives** were proposed: to identify motivators for and inhibitors to ICT adoption in Nigerian SMEs; to determine the level of ICT utilisation amongst SMEs in Nigeria; to determine the impact of ICT on SMEs' organisational performance; to ascertain the level of utilisation of sophisticated ICT applications/systems by Nigerian SMEs; to recommend success strategies that would stimulate/increase the adoption and utilisation of ICT in Nigerian SMEs.

1.4 SMEs in Nigeria

In Nigeria, the National Council of Industries refers to SMEs as business enterprises whose total costs, excluding land, are not more than two hundred million naira (₦200, 000,000.00) (Onugu, 2005). However, the Small and Medium Sized Development Agency of Nigeria (SMEDAN) defines SMEs based on the following criteria: a micro enterprise as a business with less than 10 people with an annual turnover of less than ₦5,000,000.00, a small enterprise as a business with 10-49 people with an annual turnover of ₦5 to

49,000.000.00; and a medium enterprise as a business with 50-199 people with an annual turnover of ₦50 to 499,000.000.00. This research adopts the definition of SMEDAN (2005) as summarised in the following table.

Table 1.1: Definition of SMEs in Nigeria (SMEDAN, 2005)

Size Category	**Number of Employees**	**Assets (₦ million) excluding land and buildings**
Micro Enterprises	Less than 10	Less than 5 million Naira
Small Enterprises	10 - 49	5- less than 50 million Naira
Medium Enterprises	50 -199	50-less than 500 million Naira

The use of ICT in SMEs is described by Apulu and Latham (2011c), as a strategic tool that brings about competitive advantage. In developed and developing countries, SMEs play an important role in the process of industrialisation, economic growth and in the area of job creation (Adekunle and Tella, 2008; Apulu and Latham, 2010). Some researchers (e.g. Golding et al., 2008; Berisha-Namani, 2009) have observed that SMEs play a major role in poverty alleviation in developing countries and also stimulate domestic and regional economic growth in national and regional economies. Ongori (2009**)** states that SMEs help to diversify economic activities and are flexible to changing market demands. Furthermore, Ongori and Migiro (2010) ascertain that SMEs not only help to improve the living standards of people but bring about substantial local capital formation and achieve high levels of productivity and capacity. SMEs are increasingly recognised as a major means for achieving a viable industrial diversification in many countries; therefore, SMEs serve as drivers of economic growth.

In Nigeria, SMEs' contribution to the economy is of notable significance as 70% of the country's employment is generated by SMEs (Aina, 2007). Odeyemi (2003) further states that SMEs in Nigeria are diverse groups of businesses, usually operating in different sectors of the economy and account for over 50% of the country's Gross Domestic Product (GDP).

There have been many discussions on the importance of the SME sector to many economies. For example, Apulu and Latham (2009a); Mpofu et al. (2009); Ongori (2009); Ongori and Migiro (2010) amongst others have highlighted that the use of ICT in SMEs can assist in promoting SMEs' competitiveness. Ongori (2009) argues that SMEs are

compelled to adopt ICT in their business processes in order to cope with the challenges in the business environment. In other words, ICT has become indispensable for all kinds of businesses.

1.5 Statement of Research Problem

It is often argued that the effective utilisation or increased use of ICT supports or shapes the strategies of many organisations (Henderson and Venkatraman, 1999). According to Kyobe (2004), the effective utilisation of ICT refers to the use of ICT resources such as hardware and software to provide an organisation with a competitive advantage. Hyvönen et al. (2003) advocate that the utilisation of ICT is one of the key areas that modern companies develop in order to achieve strategic gains. Researchers (e.g. Sheppard and Hooton, 2006; Alam et al., 2007), have shown that the adoption of ICT improves SMEs' performance; however, despite the high diffusion growth rate of digital technologies globally in recent years, the use of ICT within SMEs in Nigeria remains low (Apulu and Latham, 2009c). Ihua (2009) advocates that Nigerian SMEs still fall below expectations due to a number of factors that affect their development. ICT adoption in Nigeria's SMEs has been quite slow in comparison to other countries such as the United Kingdom and the United States (Lal, 2007; Apulu and Latham, 2009). There are potential and immense contributions from the SME sector towards sustainable economic development; however, the problems experienced by Nigerian SMEs tend to have a negative effect on their utilisation of ICT and their ability to adopt more sophisticated ICTs (Apulu et al., 2011).

In spite of the growing number of studies on the adoption of ICT in SMEs, literatures (e.g. Harindranath et al., 2008; Olatokun and Kebonye, 2010; Ongori and Migiro, 2010) still suggest the need for further research on the key factors that affect its effective utilisation in different contexts around the world. Research in the area of ICT utilisation in SMEs is still under-researched in developing countries and Nigeria is no exception. Aleke et al. (2009) also state that the benefits brought about by the emergence of ICT applications have not been fully explored in the developing economies of the world. Heeks and Kenny (2002) suggested the need to understand the contextual setting of developing countries in order to effectively apply information technology developed in the west (Europe and North America) to these countries. Also, issues faced by SMEs are important as they drive the economies of many nations. Therefore, it is imperative to examine the present situation of SMEs in Nigeria and give recommendations based on the findings of the research.

1.6 Research Aim

As a result of the issues identified in section 1.5, the primary aim of this research is to identify/recommend strategies that would assist in stimulating or increasing the adoption and utilisation of ICT in Nigerian SMEs. The research looks at the current level of ICT utilisation by SMEs in Nigeria as well as likely motivators and inhibitors of ICT adoption, considering this present era of globalisation where ICT is regarded as a vital tool for SMEs. Likewise, it is important to determine the impact of ICT on the SMEs' organisational performance.

Pasanen (2006) states that previous research has suggested a number of determinants which influence SMEs' development but researchers are still not close to arriving at a consensus regarding these factors. Identifying the influencing or inhibiting factors for instance, would assist in determining the reasons for Nigerian SMEs' adoption or non-adoption of ICT and further help to understand the extent to which they currently utilise ICT. An understanding of these determinants can provide an avenue for policy-makers, stakeholders and practitioners to stimulate the rate of ICT adoption and utilisation within SMEs and consequently, e-commerce, e-business, cloud computing (a more recent technology) and so on, thereby assisting in the further development of the SME sector.

1.7 Research Questions

The development of a research question is a process of looking at an issue that might be a problem and formulating a question about it. Sweet and Grace-Martin (2003) state that the research question emphasises a lack or absence of understanding about an issue. It refers to the gap that the researcher intends to address. To achieve the research aim stated in Section 1.6, the following research questions have been formulated which are comprised of the main research question as well as sub-research questions. The main research question for this study is:

How can the factors affecting the adoption and effective utilisation of ICT in developing countries SMEs be resolved (in the case of Nigeria)?

1.7.1 Sub-Research Questions

1. What are the motivators for and inhibitors to ICT adoption in Nigerian SMEs?
2. What is the current level of ICT utilisation amongst Nigerian SMEs?

3. How does the use of ICT affect/impact on the organisational performance of Nigerian SMEs?
4. To what extent do Nigerian SMEs utilise sophisticated ICT systems?
5. How can the adoption and effective utilisation of ICT be improved in Nigerian SMEs?

1.8 Research Methodology

This section presents an overview of the research methodology applied in this project. The research is exploratory and descriptive in nature and adopts a qualitative research approach. Nonetheless, a survey has been used to provide an exploratory snapshot of the SMEs in context. Due to the exploratory nature of the research aim in section 1.6, the research adopts an interpretivist epistemological stance which is consistent with the qualitative research mode chosen. Denzin and Lincoln (1994); Creswell (2003) and Bryman (2004), state that the interpretivist epistemological stance emphasises the need to understand the social world through an examination of the interpretation of that world by its participants. The research also employs a case study strategy which is appropriate for investigating a contemporary research phenomenon. Denzin and Lincoln (1994) stress that qualitative researchers study things in their natural settings, attempting to make sense of phenomena in terms of the meanings people bring to them.

A triangulated data collection method was adopted after conducting an extensive review of literature relevant to the topic under study. This involved the collection of data in two phases. In the first phase of the research, a survey utilising self-administered questionnaires was conducted to identify SMEs to be interviewed and used as case studies. Semi-structured interviews were conducted in the second phase involving SMEs owners, managers, Managing Directors, Heads of departments, and so on. The interviews were conducted based on the results of the survey which complemented the case study research in terms of gathering the right sample. According to Boodhoo and Purmessur (2009), case studies are used to collect descriptive data through the intensive examination of an event in a particular group, organisation or situation. The research seeks to understand the level of adoption and use of ICT by SMEs in Lagos, a metropolitan city in Nigeria. Lagos was selected as the region for conducting the research as it is considered to be the commercial nerve centre of Nigeria, given its strategic location (South-West of Nigeria), unique demographics and contribution to the national Gross Domestic Product (GDP).

Data analysis for the first phase of the research was undertaken using descriptive statistics as well as content analysis. Content analysis involves the numerical description of the features of a given text or series of images. According to Joffe and Yardley (2010), content analysis offers a model for systematic qualitative analysis. For the second phase of the research, the analysis of data involved the use of thematic analysis. Thematic analysis, as described by Braun and Clarke (2006), is an approach that is theoretically flexible and used for analysing qualitative data. Boyatzis (1998) also advocates that thematic analysis is an analytic method that is widely used in qualitative research. Thematic analysis provides rich descriptions of experiences that are often neglected by the posivitist, scientific method (Halland, 2007).

1.9 Significance of the Study

ICT has increasingly become one of the dominant factors affecting every aspect of development all over the world. In recent times, many SMEs in developed countries are adopting and effectively utilising ICT for developmental purposes, unlike Nigeria where the use of ICT in SMEs is still very low. Currently, the area of ICT utilisation in Nigerian SMEs is still under-researched. Thus, this research is of significant importance, generating an empirically grounded understanding to help practitioners in various ICT interventions in Nigeria.

The contribution of this research work is three-fold which include: contributions to the general body of knowledge, practical and methodological contributions. In terms of contributions to the general body of knowledge, this research has significant implications for Information Systems (IS) research which seeks to understand and explain issues surrounding Nigerian SMEs in terms of their adoption and use of ICT. Since this research sets out to investigate the adoption and utilisation of ICT within organisational contexts, its findings are aimed at providing a deeper understanding of issues associated with the adoption and utilisation of ICT in a developing country such as Nigeria. In order words, the research contributes to knowledge by developing an evidence based report that describes the level of ICT adoption in Nigerian SMEs.

On the practical aspect, since this area is still under-researched, results of the study will have significant implications for practitioners, especially in the area of ICT in developing countries, particularly with regard to Nigeria. It is intended that the quantitative phase of

the study will contribute to the statistics of ICT use in Nigeria whilst the qualitative study will add to the body of literature, mainly on developing countries. Also, the research makes a practical contribution by suggesting ways through which Nigerian SMEs can successfully adopt and effectively utilise ICT in their respective businesses and further contribute towards Nigeria's socio-economic advancement.

Furthermore, the research makes a methodological contribution by employing different data collection techniques (triangulation), in addressing issues relating to ICT adoption in Nigerian SMEs, and further examines the extent to which Nigerian SMEs utilise ICT, especially sophisticated ICT applications, in conducting their business.

Results from this research will be of great benefit to senior managers, IS executives, strategic planners, business managers, government**,** amongst others, as the research will help managers to better understand the benefits associated with the adoption and utilisation of ICT by helping to provide a set of critical success and failure factors. Findings of the research will also assist to better position stakeholders, researchers and practitioners in their attempts to implement and manage ICT initiatives within SMEs in Nigeria.

1.10 Structure of the Thesis

Chapter 2 presents the geographic context of the region under study and provides insights on Nigeria as the most populous country in Africa.

Chapter 3 focuses on a review of the literature in order to define the scope of the research. It considers previous research on SMEs and ICT, and provides background information on the adoption and use of ICT by SMEs**.**

Chapter 4 discusses the research methodology and evaluates the selection of the research method adopted, highlighting the philosophical assumptions that are relevant to this study. The chapter also outlines the underlying research assumptions that guide Information Systems research and justifies the choice of a qualitative research methodology. In addition, the research design, rationale for the chosen approach and its suitability for the research are discussed. The design of the research process is presented in a diagrammatical form (flowchart) which shows the development of the thesis from the literature review stage to data analysis and framework development.

Chapter 5 presents the analysis and findings of the first phase (a survey) and the second phase (multiple case studies) of the research. The chapter includes background information on the cases that participated in the study and their experiences regarding the adoption and use of ICT. In addition, emerging themes from the case studies and results of the findings are presented.

Chapter 6 discusses the research findings and relates them to the existing literature. A framework for stimulating the adoption and effective utilisation of ICT is proposed in this chapter.

Chapter 7 describes the validation process and the methodology adopted in the validation procedure, namely external and internal validation. Participants who were involved in the first and second phases of the research were invited to partake in the validation process. They were requested to share their opinions on the research findings and recommendations in a questionnaire survey, in order to validate the proposed framework.

Chapter 8 summarises the overall findings of the research. The chapter presents the research outcomes including the achievement of the research questions. Subsequently, the chapter provides the contributions made by the research, specifically focusing on ICT adoption and utilisation amongst SMEs within Nigeria. The limitations of the research are also presented and finally some areas for further research were identified.

1.11 Summary

Chapter one covers background of the study and has presented the research aim which is aligned with the research topic. The chapter has also put forward the research questions and has reviewed literature that provides a background to the research. The literature reviewed indicate that there is an increasing demand for research on factors affecting the successful adoption of ICT and its effective utilisation in various context around the globe. Definitions of key terms for the research were presented in this chapter and the problem statement for the current research was presented. Furthermore, the chapter has briefly presented an overview of the research methodology. In addition, the significance of the research was discussed which highlighted the proposed contributions of the study. This indicated that the research will be of benefit to information systems executives, owners/managers of SMEs, the Nigerian government and other stake holders. Finally, the

thesis structure was outlined which provided an overview of the entire research and a description of the content contained in the other chapters. It is hoped that the outcome of this research will assist in increasing the level of ICT deployment by SME in Nigeria.

CHAPTER TWO - THE STUDY CONTEXT-NIGERIA

2.0 Introduction

This chapter begins by highlighting the differences between a developed and a developing country and presents an overview of Sub-Saharan Africa. It also discusses the background details to the research, specifically presenting the geographic context in which the study was conducted. Furthermore, an overview of telecommunication infrastructures in Nigeria and the Nigerian National IT Policy and Regulatory Framework are highlighted. In conclusion, the chapter describes the level of internet penetration in Nigeria as well as the level of digital divide and e-readiness.

2.1 Overview of Developed and Developing Country

A developed country is a term that is used to distinguish between the more industrialised nations, including most Organisation for Economic Co-operation and Development (OECD) member countries, and developing or less developed countries. The developed countries are sometimes collectively designated as Group B countries or the North, because most of them are in the Northern Hemisphere (ASYCUDA.org, 2010). Developed countries are also referred to as industrial countries, industrially advanced countries and high-income countries, in which most people have a high standard of living. Sometimes developed countries are also regarded as countries with a large stock of physical capital whereby most people undertake highly specialised activities. Depending on the definition, developed countries may also include middle-income countries with transition economies, as these countries are highly industrialised (World Bank Group, 2004).

A developing country is regarded as an economy with low-to-middle per capita income. Such countries constitute approximately 80% of the global population, representing about 20% of the world's economies (Akinwummi et al., 2008). Developing countries refer to a broad range of countries that generally lack a high degree of industrialisation, infrastructure and other capital investment, sophisticated technology, widespread literacy and advanced living standards among their populations as a whole (ASYCUDA.org, 2010). Developing countries are sometimes collectively designated as the Third World and sometimes as the South, because a large number of them are in the Southern Hemisphere (ASYCUDA.org, 2010). Many terms and definitions have been used to refer to and categorise countries. The World Bank classifies developing countries as countries with low

or middle levels of Gross National Product (GNP) per capita. However, Bannock (2005) describes developing countries as countries that have not yet reached the stage of growth of industrialisation, where people live on far less money, and often lack basic public services when compared to highly developed countries. According to Aleke et al. (2009) developing economies are still struggling to catch up with ICT applications as opposed to its heavy deployment in the developed economies.

Several countries with transition economies are sometimes grouped with developing countries based on their low or middle levels of per capita income and sometimes with developed countries based on their high industrialisation.

2.2 Sub-Saharan Africa

Sub-Saharan Africa (SSA) is described as a region that is technologically backwards and economically vulnerable (Udo and Edoho, 2000), hence the region has been left behind in the dawn of the new era that is characterised by the advances in ICT. Although it is believed that to some degree the digital divide is everywhere, researchers (e.g. Gyamfi, 2005; Otte and Knips, 2005) advocate that it is more pronounced in SSA countries than elsewhere in the world. According to Gyamfi (2005), SSA is regarded as the least advanced region in the world in terms of ICT, thereby leaving the region in the deepest end of the digital divide. In the present era of globalisation, the adoption and effective utilisation of ICT could act as a "lifeline" that would enable SSA to join the battle for economic, social and political empowerment in the information age. Opoku (2004) states that digital technologies have been integrated into virtually every aspect of education, commerce, health, governance and civic activity and have become factors in creating wealth worldwide. Nonetheless, regarding the importance of ICT to national development, disparities exist among nations, including Nigeria, in terms of access to and use of these technologies. Opoku (2004) further states that the disparities are usually exacerbated by structural inequalities or social characteristics of individuals such as their income, education, occupation, age, gender, ethnicity and location.

A report by the World Economic Forum (2011) entitled "Global Information Report 2010-2011" shows that despite increased uptake and positive trends in the world, SSA's networked readiness continues to be poor, with the majority of the region lagging in the bottom half of the Network Readiness Index (NRI) rankings. There are only two Sub-

Saharan economies, Mauritius (45th) and South Africa (61st), in the top of the NRI. Tunisia consolidates its leadership in North Africa at 35th place, while all other countries in the region follow a downward trend, with the exception of Morocco (83rd), which went up five places. Nigeria was placed at 104 in the study's comparison of 138 countries that make up 99% of the World's total GDP. Nigeria is still lagging in its use of ICT according to the report by the World Economic Forum (2011). Therefore concerted efforts are required to pull SSA out of the deep end of the divide and there is a need for e-readiness in SSA countries.

2.3 Geographic Context of Nigeria

Nigeria, officially the Federal Republic of Nigeria, is a country in West Africa with an estimated population of over 158.3 million (Trading Economics, 2011) and the most populous country not only in SSA but in the entire African Continent. Nigeria accounts for 47% of West Africa's population and ranks 8th amongst the top ten countries with the highest population in the world (Internet World Stats, 2010). Nigeria consists of 36 States plus a Federal Capital Territory and is known to have over 274 ethnic groups in the Federation which is divided into three major regions and grouped under six geopolitical zones with a total of 774 Local Government Areas (LGAs) (Gbenga-Ilori and Ibiyemi, 2010). Nigeria has an area of 923,768 sq km and shares land borders with the Republic of Benin in the West, Chad and Cameroon in the East, Niger in the North and boarders of Gulf of Guinea in the South (Internet World Stats, 2009). Nigeria is bounded in the South by the Atlantic Ocean and since 1991 the country's capital has been centrally located in the city of Abuja. Previously, the Nigerian government was headquartered in Lagos.

Nigeria is Africa's largest producer of oil and is regularly the fifth largest oil exporter to the United States (Ploch, 2011). By some estimates, Nigeria could rank among the world's top five exporters of oil within a few years, although social unrest and corruption in some areas of the country have posed significant challenges to oil production (Ploch, 2011). Obadan (2002), comments that Nigeria is a country with an abundant supply of enormous human, agricultural, petroleum, gas and large untapped solid mineral resources. Yet, since her independence from British rule in 1960, the country has gone through decades of political instability and this has brought with it a climate of social tension and an unpredictable market for businesses (Onuorah, 2009).

Despite recent real growth rate in its economy of 5.63% in 2006, 7.64% in 2007 and an IMF projection of 9% in 2008, the income earned by workers is generally low; the minimum monthly wage is US$116 (₦18,000) (Rate at US$1=₦155) and 70% of its population live below the poverty line (Lamido, 2010). A breakdown of the statistics available on Nigeria shows that in 1996 the poverty rate in Nigeria was 46% (Ezigbo, 2009), while in 2002, the poverty rate was about 67.8% (Jegede, 2002). But instead of reducing, it rocketed to 76% in 2009 with the majority of people residing in rural areas (Ezigbo, 2009). Figure 2.1 displays the Nigerian map which constitutes the geographic context of this study.

Fig 2.1: Geographic Context of the Study - Nigeria Map (Adapted from CIA, 2011).

2.4 Nigerian Economy and the Telecommunications Industry

Nigeria is currently regarded as a country that has one of the fastest growing telecommunications markets in Africa. This is because the Nigerian telecommunications sector/industry has experienced tremendous transformations in recent years due to the liberalisation of the sector and the current competition amongst private operators. Currently, there is a unified licensing regime in place which allows telecom operators to

offer converged services (Broad Group TMT Ventures, 2010). The Nigerian telecommunications sector is also identified as one of the fastest growing mobile markets in recent times (Miniwatts Marketing Group, 2009) and it is noted that mobile subscribers increased from 30,000 at the beginning of the millennium to 8.5 million by the end of 2004 (NCC, 2005). However, the total number of fixed lines (including fixed wireless access) was only 1.4 million at the end of 2009 (Broad Group TMT Ventures, 2010). In Nigeria, there are more than 70 million mobile subscribers presently, hence Nigeria is regarded as a country with the largest mobile subscriber base in Africa. According to Charles et al. (2007), the number of Nigerians using wireless phones has grown exponentially while the number of Nigerians using landline phones has reduced.

The telecommunications industry in Nigeria is playing a significant role in the development of the country's economy, especially in the area of mobile communication. The use of the Global System for Mobile Communication (GSM) has contributed greatly in the areas of employment generation, foreign direct investment and private investment (Ajiboye et al., 2007), and is now regarded as an essential part of the culture and life style of Nigerians. The GSM revolution began in August 2001 and mobile telephony has now become the most popular method of voice communication in Nigeria (Jidaw.com, 2009). This improvement in the telecommunications sector has had a significant impact on other sectors as well. For example, it has created numerous opportunities for small and medium sized businesses in franchises, dealerships, retailerships and value added services within the GSM market (Tella et al., 2007).

Likewise, Sulaiman (2010) emphasises that since the introduction of GSM in Nigeria, the country has witnessed an unprecedented massive development of telecommunication infrastructure across the country by the operators. Indeed, the rate of investment in the telecom sector since 1999 is regarded as second to the oil industry. This has opened up huge business opportunities in the telecom industry. The GSM has also revolutionalised the business environment as people can transact their businesses from the comfort of their homes through the use of GSM facilities (Udutchay, 2008).

At the same time, social relationships have been enhanced as GSM is able to make people communicate with each other, on a real time basis, saving time and money, among other conveniences (Elegbeleye, 2005). GSM has also empowered the people economically

through the creation of mass employment. Currently, many previously unemployed people are now earning their living by making phone calls, selling recharge cards and GSM accessories (Sulaiman, 2010). Equally GSM has become a major source of revenue for the government.

Nigeria is known to have the largest market for telecommunication in Africa and the Middle East and also possesses the most vibrant fixed and mobile telephony companies in Africa (NCC, 2005), yet the demand for more subscribers continues to rise. There is substantial evidence showing the deep quest by consumers, not just for lines but also for good quality services from the operators (NCC, 2005). In spite of this growth trend in Nigeria's telecommunications sector, there have been issues that impede the further development of the industry, such as lack of power supply, insecurity, lack of infrastructural facilities, high import duty on telecommunications equipment which are in the range of 30-70%, anti-competetive practices leading to operators forming cartels to frustrate the natural interplay of market forces, lack of financial resources and high operational cost amongst others (NCC, 2005).

Also, despite the massive improvement in the telecommunications sector as a result of the increase in mobile telecommunication, the telecom industry has been unable to meet the demand of the people as the lack of sufficient telecommunications infrastructure remains a bottleneck (Jidaw.com, 2009). This impedes the effective deployment of technology, especially in rural areas, that is required for the further growth and development of Nigeria. Olumide (2007) argues that there is a need for communication to be regarded as a catalyst for growth and development as a result of Nigeria's large population, and emphasises that the most significant opportunity for Nigeria is in mobile communication. However, Charles (2006) states that Nigeria's aging and inefficient telecommunications infrastructure has been a 'speed bump' on the information super highway.

In order to develop a nation to its full potential in the current era of globalisation, it is vital to have adequate telecommunications infrastructures as the development of these infrastructures significantly help to boost the economic growth and development of any nation (Tella et al., 2007). Information tools such as telephones, personal computers and the internet are regarded as critical to economic success and the personal advancement that assists in boosting economic growth. Ndukwe (2004) states that modern digital

telecommunication networks are essential for economic growth and these networks help to attract foreign investment. Moreover, reliable telecommunication networks can improve the productivity and efficiency of other sectors of the economy and enhance the quality of life generally.

Research, especially in developed countries (e.g. International Telecommunications Union, 2006; Sridhar and Sridhar, 2003) has shown that there is a positive correlation between telecommunication infrastructure development and economic growth.

2.5 Nigerian National IT Policy and Regulatory Framework

The developing use of Information and Communication Technologies in various areas has motivated the need for an IT or ICT policy in different countries. IT policies are built on reliable human resources and infrastructures that constitute the fundamental tool and means of assessing, planning, managing developmental change and for achieving sustainable growth (Adedoyin et al., 2008). In view of this, every progressive country has a national IT/ICT policy and an implementation strategy. A national IT policy can be described as a standard document that states the IT norms, guidance and principles for issues of national interest. The guidance must be adhered to while applying IT/ICT in the various national issues in order to properly respond to the emerging global reality and thus avert becoming a victim of the digital divide (Adedoyin et al., 2008). It is a public document and hence accessible to all stakeholders in all issues of national interest.

In 2001, Nigeria developed its national IT policy with the vision of making IT an engine for sustainable development whereby the country could become a key player in global information society. The policy was implemented by the government, as part of the public sector reform agenda, after the Nigeria Telecommunications Act was passed by the National Assembly to give autonomy to the Nigeria Communications Commission (NCC) as the telecommunications regulator responsible for the implementation of the policy (Agyeman, 2007). The National Information Technology Development Agency (NITDA) was the regulatory body charged with the responsibility for the implementation of this IT policy (Ajayi, 2003). The general objective of the IT policy was to standardise the Nigerian Information Technology Society with the view to producing a very high performing national workforce that competes globally in the IT driven economy (Adedoyin et al., 2008). The vision statement of the IT policy is to make Nigeria an IT capable country in

Africa and a key player in the information society, using IT as the engine for sustainable development and global competitiveness (NITDA, 2001).

The IT policy document focused on several areas of national interest such as assisting to provide incentives to telecom investors and operators in order to facilitate their entry into the Nigerian telecommunication market; also, waiving tax and import duties, promoting and providing access to telecommunications facilities and services at reduced cost, thereby increasing ICT penetration (NITDA, 2001). The policy also focused on deregulating, liberalising and privatising the telecommunications industry and recognised the private sector as the driving force of the IT sector. The government has also introduced convergent licensing for Internet Service Providers (ISPs) to reach out to disadvantaged communities and rural populations (Agyeman, 2007). Although the policy aims at using IT for wealth creation, poverty eradication, global competitiveness and education, Agyeman (2007) states that the vision is yet to be fulfilled. In 2008, the policy was reported to be overdue for review due to changes and advances in IT globally and in Nigeria particularly. The government therefore decided to set up the Nigerian National ICT for Development (ICT4D) Strategic Action Plan Committee to help develop a new ICT policy that will serve as the new ICT action plan/roadmap for the nation (Adedoyin et al, 2008). In Nigeria, there are a number of regulatory bodies that handle telecommunication matters, some of which are described in appendix J.

2.6 Internet Penetration in Nigeria

The internet has become an extremely important modern day technology for businesses (Sellitto and Martin, 2003). It is known as the communications protocol that enables heterogeneous computers and protocols to communicate, thus linking local area networks into a single communication network (Montealegre, 1998). The internet was developed during the 1960s by the United States Department of Defence Research Projects Agency and afterwards it has been integrated globally into everyday activities such as leisure, health and work and by business enterprises (Teo and Tan, 1998). According to Willis et al. (2002), the internet has revolutionised the manner in which businesses are conducted all over the world.

Tidd (2001) considers the internet to be one of the “defining symbols” of 21st century innovation that has transformed the conceptual notions of how people value knowledge to

create a new economy. Levy and Powell (2003) and Tidd (2001) advocate that what brings about innovation in new economies is immediate access to the worldwide market of information, better speed to market, transformation of business processes and a shift in the balance of power between suppliers and consumers as information becomes more widely available. Between the years 2000 and 2005, developing countries' internet users' population grew by more than 30% to roughly 400 million, increasing their global share of all internet users from 25% to 40% (Molla and Heeks, 2005; UNCTAD, 2005).

Chin and Farlie (2006) state that the use of the internet, especially in developing countries, has expanded rapidly in recent years; nevertheless, penetration rates differ clearly between developed and developing countries, and across developing countries. On the one hand, Chin and Farlie (2006) argue that human capital, youth dependency ratio, telephone density, legal quality and banking sector development, are associated with the rate of internet penetration and that factors associated with computer and internet penetration do not differ substantially between developed and developing countries. On the other hand, Mutula (2005) argues that the penetration of the internet in Africa differs from one country to another depending on each country's government policy, legal and regulatory frameworks, competition amongst Internet Service Providers (ISPs) and prices of telecommunication services. Nevertheless, Chin and Fairlie (2006), comment that the surge in computer and internet trends in developing countries within the past few years has changed because the use of technology has considerably increased as compared to a few years ago for almost every country in the world.

Internet connectivity in each of the world's continents far exceeds that of Africa (Mutula, 2003). The International Telecommunication Unit (ITU) report in 2006 stated that Africa had about 850 million people and about 13% of the world population and as at 2005 had about two PCs per 100 inhabitants with an internet penetration of less than 4%. The global average internet penetration rate was more than 15% but the situation in SSA was worse (ITU, 2006). Whereas, the ITU report in 2010 indicate that the number of internet users has doubled between 2005 and 2010. While 71% of the population in developed countries are online, only 21% of the population in developing countries are online. The report further indicated that at the end of 2010, internet user penetration in Africa was 9.6%, far behind both the world average of 30% and the developing country average of 21% (ITU, 2010). In developing countries 72.4% of households had a TV as at the year 2010, only 22.5% had a

computer and only 15.8% had internet access (compared to 98%, 71% and 65.6% respectively in developed countries). However, at the end of 2010 the number of people having access to the internet at home had increased from 1.4 billion in 2009 to almost 1.6 billion (ITU, 2010).

Omona and Odongo (2006) state that despite the encouraging developments that have emerged in the last few years as a result of the increasing trends towards liberalisation, differences in ICT penetration between SSA and the rest of the world remain wide.

In December 2009, it was declared in Nigeria that 11 million of the country's population were users of the internet, assisting Nigeria to be considered as one of the countries in Africa with a high population of internet users. As of June, 2010, there were 43,982,200 internet users comprising 28.9% of the country's population, as indicated in table 2.1. It is obvious that there has been a remarkable increase in terms of internet usage in Nigeria between the years 2000 and 2010. The current development shows that in the last few years, computer access and internet penetration has increasingly grown and this indicates a brighter future for internet users in Nigeria. However, the status of internet development and connectivity in Nigeria is still low when compared to developed countries and internet connectivity in the entire continent of Africa is still very poor, unreliable, scarce and very expensive where available. According to Aluoch (2006), users have to contend with frequent service outages and very slow speeds.

Table 2.1: Nigeria Internet Usage in 2010 (Internet World Stats, 2010)

YEAR	Users	% Penetration	Usage Source
2000	200,000	0.1 %	ITU
2006	5,000,000	3.1 %	ITU
2010	43,982,200	28.9 %	ITU

2.7 Digital Divide

The digital divide is a phenomenon linked not only to the topic of access to the internet, but also to its usage and benefit (Fuchs and Horak, 2006). The phrase 'digital divide' refers to the unequal access to ICTs between countries, regions, and even social groups within countries (Tigre and O'Connor, 2002). Rao (2005) states that digital divide is not a situation that is limited only to developing countries, as many wealthy nations also suffer from some form of digital divide. It is regarded as a complex, multidimensional concept. Even within countries there exists a divide as there is often a rural and urban divide and a

divide between high and low-income earners (Mehta and Kalra 2006; Purcell et al., 2004). Peters (2003) explains that the digital divide between countries is usually measured in terms of the number of telephones, computers and internet users. Apart from the digital divides that exist between countries, analysts also describe the unequal access to ICT within countries as the domestic digital divide between the haves and the have nots (Sciadas, 2002). Kamel (2007) also states that there is an increasing digital divide between developed and developing countries. He went further, identifying four aspects of the digital divide: people, information, knowledge and technology. Peters (2003) explains that digital divide is a complex problem, presenting both practical and policy challenges.

Cayla et al. (2005) also describe digital divide as the unequal access to ICT. Digital divide examines the disparity in the diffusion of ICT between developing and developed countries, well-educated and poorly educated populations or between poor and rich citizens (Cayla et al., 2005). The digital divide can also be seen as an expression of social and economic inequalities, with ICT having the potential to reproduce and increase the social and economic inequalities already existing throughout society (Gomez and Martinez, 2000; Hill and Beynon-Davis, 2007). Harris (2002) further comments that the digital divide describes the stark disparities between the few people with abundant access to ICTs and the vast numbers of people without any access.

Similarly, Dewan and Riggins (2005) refer to digital divide as the separation between those who have access to digital information and communications technology and those who do not. They argue that the digital divide can be grouped into individual level, organisational level and global level. The individual level refers to those who are technologically, sociologically, or economically disadvantaged who may lack or forego access to ICT, creating a gap between themselves and those who choose to make ICT an integral part of their daily life as there is a considerable variation in the access to technology across geographical areas. In the organisational level, however, some organisations use ICT to gain advantage over their rivals and redefine the rules of engagement within their industry, while others lag behind as technological followers potentially putting themselves at a strategic disadvantage. In the global level, even though some countries have heavily invested in ICT and have adopted policies to promote corporate and individual adoption, other countries are being left behind technologically (Dewan and Riggins, 2005). Wade (2002) further states that the digital divide is not a completely new phenomenon but rather

represents other long-term and pre-existing forms of economic and social divisions. Kelly and Biggs (2007) simply describe digital divide as the inequalities in access to ICT. However, DiMaggio et al. (2004) conclude that the digital divide can be defined in several ways, depending upon how access and differences in usage are defined and measured.

The concept of digital divide in this research refers to the widening imbalances of non-adoption and ineffective utilisation of ICT. Digital divide is a phenomenon that limits the numerous uses, benefits and advantages that come with ICT. Many believe that universal access to ICT would bring about a global community of interaction, commerce and learning resulting in higher standards of living and improved social welfare. However, the digital divide threatens this outcome, leading many public policy makers to debate the best way to bridge the divide (Dewan and Riggins, 2005).

Chin and Fairlie (2006) state that the largest single factor contributing to the disparities in computer penetration rates between developed and developing countries is per capita income. The Parliamentary Office of Science and Technology (2006) reports that OECD countries have the highest access to ICT followed by South Asian and some African countries but SSA countries fare worst (excepting South Africa), and Nigeria is no exception. According to Chin and Farlie (2006) developing countries have a long way to go in terms of closing the gap of digital divide. Hence, Kamel (2007) recommends that critical aspects of digital divide should be developed, for an effective implementation to take place and that developing nations when addressing future development and growth, should work out a formula that integrates the developments that have been taking place worldwide over the last few decades, work-out a formula that addresses its specific needs and at the same time optimally allocate its resources to serve their business and socio-economic development.

Peters (2003) suggests that the solutions that work in developed countries cannot work in developing countries, hence, solutions must be based on an understanding of local needs and conditions. The importance of understanding local needs in addressing the internal digital divide has also been addressed by Khan (2000), who emphasises that in Africa and other parts of the world, the value of local knowledge and understanding must be recognised while implementing ICT development projects. Walsham (2001) and Rooksby and Weckert (2004) advocate that it is important to be aware of mechanisms and

consequences that could be creating, perpetuating or exacerbating already existing differences between the 'haves' and 'have nots'. In other words, some necessary reflection on the digital divide needs to take place at every point. Nonetheless, Andrade and Urquhart (2009) state that the efforts to close the digital divide are not yet enough. Furthermore, Achimugu et al. (2009) state that developing countries have challenges preventing them from overcoming the digital divide with regard to internet connectivity which include inadequate communications network infrastructure, relatively high cost of equipment, lack of governmental interest and support, and inadequate technical and management support for internet connection. According to Gbenga-Ilori and Ibiyemi (2010), other challenges peculiar to rural areas of developing countries such as Nigeria include remoteness which leads to higher maintenance costs, low population density which again lead to higher maintenance costs, low-earning capacity of the rural population and poor education.

Additionally, Kelly and Biggs (2007) state that mobile phones, particularly in developing countries, could play an important role in reducing the digital divide. In developing countries the number of mobile phones rose from a mere 12 million in 1995 to over 1.15 billion in 2005 (Kelly and Biggs, 2007) while over the period 2000 - 2005 the African mobile market grew twice as fast as the global market. The mobile phone ratio in SSA is even more strongly biased towards mobile telephony, with nine out of every ten users of a telephone making use of a mobile phone (Toure, 2007). The growth in mobile telephony has shifted the balance between fixed line and mobile services (Kew and Harrington, 2009).

Jagun et al. (2008) conducted a study in Nigeria, exploring the actual impact of mobile telephony amongst weavers. The study discovered that with mobile telephony, costs and risks were being reduced and time saved, often by the substitution of journeys. However, the weavers saw a continuing need for journeys and physical meetings due to issues of trust, design intensity, physical inspection and exchange, and interaction complexity. Similarly, Kew and Harrington (2009) state that nine out of every ten users of a telephone make use of a mobile phone and suggested that mobile telephony increased the speed of and access to information and reduced the cost of communication. Hence, the authors conclude that trading, when assisted by mobile telephony, should therefore become quicker, cheaper and less risky.

2.8 Factors contributing to Digital Divide in Nigeria

A high level of inequality exists between the rural and urban areas in Nigeria. Statistics show that rural areas have the highest poverty level with 70% of the rural population living below the poverty line (IDA, 2009). Infrastructure, especially telecommunication and electricity, in rural areas remains in poor shape (Obaji, 2005). According to a survey conducted (UNESCO, 2004), about 68.4% of the country do not own a television set, with a higher number of affected citizens living in the rural areas (Gbenga-Ilori and Ibiyemi, 2010). This is as a result of the high poverty level and poor electricity supply, most especially in rural areas.

The rural communities in Nigeria suffer from marginalisation in the area of ICT provision due to illiteracy and lack of access to many of the opportunities available to them. These rural areas are denied ICT access, hence there is no internet usage in most of the rural areas within Nigeria. Doczi (2000) states that this marginalisation has led to a digital divide which is defined as the gap between those who have adequate access to ICTs, such as computers and internet, and those who have limited or no access, due to socio-economic or geographical reasons, or both. Gbenga-Ilori and Ibiyemi (2010) summarise the effect of digital divide as social isolation, economic inequality, reduced national economic growth and innovation, and reduced democratisation.

2.9 Electronic Readiness (e-readiness)

Dada (2006) defines electronic readiness (e-readiness) as a measure of the degree to which a country, nation or economy may be ready, willing or prepared to obtain benefits which arise from ICT. When a country uses ICT to conduct more of its activities, the economy can become more transparent and efficient (Economist Intelligence Unit, 2009). E-readiness is often used to measure or gauge the readiness of a country to participate in electronic activities such as e-commerce and e-government. In most cases e-readiness is represented in terms of indices where countries are rated in various areas such as the number of telephone lines per 100 people or the percentage of GDP spent on ICT infrastructure. These results are normally tabulated and can be used to make comparisons between countries in the form of rankings as well as using longitudinal studies within countries (Economist Intelligence Unit, 2009). Nigeria ranked 62 on the Economist Intelligence Unit e-readiness rankings in 2009 and 61 in 2010 (Economist Intelligence Unit, 2009; 2010). According to the Economist Intelligence Unit (2007), e-readiness is

"the state of play of a country's information and communications technology infrastructure and the ability of its consumers, businesses and government to use ICT to their benefit".

Similarly, Gunasekaran and Harmantzis (2007) argue that the e-readiness of a country indicates the ability of its principal stakeholders, government, citizens and businesses to leverage the potential of ICT. Dada (2006) also states that e-readiness is a measure of the degree to which a country or nation or economy may be ready, willing or prepared to obtain benefits which arise from ICTs. Although most e-readiness tools are developed as a means of assessing or ranking countries, there are some works that examine the e-readiness of businesses and individuals within a country. In some cases, e-readiness has been described as an organisation's assessment of the e-commerce, managerial, organisational and external situations in making decisions about adopting e-commerce (e.g. Molla and Licker 2005) and the ability to pursue value creation opportunities facilitated by the use of the internet (Maugis et al., 2005).

Therefore, e-readiness in the context of this research can be described as the ability for Small and Medium Sized Enterprises (SMEs) to adopt and utilise value added opportunities created by ICT, as a way of further strengthening their businesses and increasing their competitiveness. Jennex et al. (2004) also used the term 'e-readiness' in the context of business and identified infrastructure success factors. E-readiness is a term that has received much attention in the present era of ICT and economic growth. Rizk (2005) comments that e-readiness tools provide general insights into a country's ICT environment but internal disparities within a country are usually ignored and as such, could be deceptive. According to the Economic Intelligence Unit (EIU) report 2010, Nigeria ranks 61 despite the substantial development or growth of ICT in recent years.

The review suggests that many countries in SSA are still technologically backward, including Nigeria, despite the increased uptake of ICT in the world. Although the telecommunications industry in Nigeria is significantly enhancing its economic development, Nigeria has continued to lag behind in its adoption and utilisation of ICT. Also, Nigeria is recognised as an oil rich country yet the country's overall development has been hindered by several issues which also affect the SMEs sector. For example, the uptake of internet connectivity is still low when compared to many developed countries, as reported by Internet World Stats (2010) and this also inhibits Nigerian SMEs from

adopting/utilising ICT. There is a need to pull Nigeria out of this divide, which will also, assist in increasing the country's uptake of ICT in SSA. Thus, measures have to be put in place to help resolve the current problem.

2.10 Summary

The chapter has highlighted the differences between developed and developing countries and has described SSA as the least advanced region in the world with regard to the use of ICT. The geographic context of Nigeria as a developing country in SSA, with the largest population in the African continent has also been discussed. Nigeria has been identified as a country with the largest telecommunication market in Africa and an overview of telecommunication infrastructures in Nigeria has been presented. Also, a review of the Nigerian National Information Technology policy which is used as a guide for handling national issues related to ICT has been presented. The chapter further considers the level of internet penetration in Nigeria which is regarded as being very low when compared to developed countries, despite Nigeria's remarkable increase in internet usage between 2000 and 2010. In addition, a review of the digital divide was presented, which shows that there are factors preventing developing countries from overcoming the problem of digital divide. It was also noted that there exists a digital divide between the urban and rural areas in Nigeria whereby the rural communities suffer from marginalisation in terms of ICT utilisation. Finally, there was a discussion on e-readiness, which is regarded as a measure of a country's readiness to participate in electronic activities and the ability of a country to leverage the potentials of ICT. This chapter has so far, put into context the way in which Nigeria operates as a developing country.

CHAPTER 3 - LITERATURE REVIEW - DEFINING THE SCOPE OF THE RESEARCH

3.0 Introduction

There is growing recognition of the importance of Small and Medium Enterprises (SMEs) in economic development, as their performance is of interest to all countries (Olutunla and Obamuyi, 2008). SMEs contribute greatly to the social and economic development of many economies (Abor and Quartey, 2010), as they contribute significantly in employment generation, income generation and also assist in speeding up developments in urban and rural areas (Olutunla and Obamuyi, 2008). In many of the newly industrialised nations, more than 98% of all industrial enterprises belong to the SMEs sector and account for the bulk of the labour force (Sanusi, 2003). In Africa, SMEs play a crucial role in stimulating growth due to their economic influence (Abor and Quartey, 2010)**.** The relative importance of SMEs in developed as well as developing countries has led and will continue to lead to a reconsideration of the role of these enterprises in the economy of nations (Ayanda and Laraba, 2011). Likewise, SMEs are currently utilising ICT around the globe, not merely for cutting costs and improving efficiency, but also for providing better customer service. ICT is regarded as the backbone of all new age technologies, without which other technologies may fail to be adopted (Mugodi and Flemming, 2003). Moreover, Ashrafi and Mutarza (2008) confirm that governments around the world are adopting ICT, to enable them to provide better services to their citizens. Thus, Harindranath and Sein (2007) state that ICT plays an important role in national development. Besides, Harindranath et al. (2008a) advocate that ICT adoption studies constitute a significant area of research within the Information Systems (IS) domain but nevertheless, there is the need for continuous research in the area, in order to better understand factors that drive or inhibit the adoption and use of ICT within the specific context of SMEs. The aim of this chapter is to identify trends in the literature as well as establish theoretical foundations for this research by presenting relevant research findings of other scholars that are related to the subject under consideration. A number of the challenges discussed in this chapter were derived from studies conducted in developed countries from which ICT adoption emanated.

3.1 Small and Medium sized Enterprises (SMEs)

SMEs have been defined based on various criteria in Chapter one, and are widely acknowledged as the springboard for sustainable economic development. They are

generally distinguished by the nature of their production and management arrangements, trading relations, financial practices and internal competence (Ongori and Migiro, 2010). SMEs vary in size, age, sector, motivation, mode of organisation, ethnic background, location, knowledge base, power and control of resources and innovative capacity (Vivienne and Roberts, 2005). Researchers (e.g. Bunker and MacGregor, 2000; Sharma and Bhagwat, 2006) have examined the differences in management style between large businesses and SMEs. These studies have shown that among other characteristics, SMEs tend to have a small management team (often one or two individuals) and are strongly influenced by the owner and the owner's idiosyncrasies. Also, they have little control over their own environment and often have the desire to remain independent (Ongori and Migiro, 2010).

3.1.1 Characteristics of SMEs

Hudson et al. (2001) argue that SMEs have very distinct characteristics. On the positive side they are able to adapt quickly in the way they work. In SMEs, decisions can be acted upon quickly and they have a close proximity to their market and significant customer loyalty (Costello and Reece, 2005). Levy and Powell (2005) state that SMEs have the reputation of being able to respond readily to customers' changing needs. Cragg and King (1993) further state that SMEs have specific attributes that distinguish them from large enterprises in the way they develop their corporate strategies and their technology policies. Large companies typically have well-defined processes for developing and implementing strategies through a corporate planning process, while SMEs often use less structured approaches, strategies and policies that may not be formulated but may emerge from a set of actions and experiments (Mason, 1997). According to Hudson et al. (2001), SMEs may be differentiated from larger companies by a number of key characteristics such as personalised management with little devolution of authority, severe resource limitations in terms of management and manpower, as well as finance, reliance on a small number of customers, limited markets operations, flat and flexible structures, high innovatory potential, reactive, fire-fighting mentality and informal dynamic strategies.

A major characteristic attributed to SMEs is flexibility (Levy and Powell, 2005). Storey and Cressy (1995), state that SMEs are more flexible than large firms hence they bring about innovation in terms of their goods and service. SMEs usually operate on a flat management structure and are associated with small management teams and in most cases

SME managers work closely together on a day-to-day basis (Onugu, 2005). According to Levy and Powell (2005), SMEs' survival is often ascribed to their adaptability and speed of response to environmental change.

Oyefuga et al. (2008) state that SMEs are more labour intensive and capital intensive than large enterprises. SMEs also have fewer resources and expertise in terms of management of new technologies (Raymond et al., 1998; Blili and Raymond, 1993; Cameron and Clarke, 1996; MacGregor et al, 1998; DeLone, 1988). Furthermore, Singh et al. (2008) argue that the majority of SMEs are known to have simple systems and procedures which allow immediate feedback, a short decision-making chain, better understanding and quicker response to consumer needs than larger organisations.

MacGregor et al. (1998) identified some general characteristics of SMEs based on the organisational environment in which most SMEs operate. These include a small management team; centralised power and control; informal and inadequate planning and control systems; lack of control over the business environment; lack of resources; limited process and product technology; limited market share; heavy reliance on few customers and a chaotic organisational structure. The authors also state that SMEs have the distinctive advantage of being responsive, flexible, flat structured and simple. Raymond et al. (1998) argue that SMEs are characterised by low levels of organisational maturity hence planning and control processes are generally less formalised. Also, decision-making is often the sole responsibility of the owner-manager.

Gholami et al. (2010) regards SMEs as firms that have fewer employees and a lower annual turnover and assets than large firms such as multi-national companies. The authors state that in SMEs decision-making is centralised and key decisions such as IT adoption are made solely by high authority individuals in the firm such as the Chief Executive Officer (CEO) or Information Systems (IS) manager. There is limited long-term planning as a result of their highly competitive business environment and there is greater dependence on external expertise and services for IS (Premkumar, 2003). However, there have been numerous reports on SMEs lacking in resources, experience, skills and knowledge, often placing SMEs at a disadvantage when competing with big companies in a globalised world (Bell et al., 2004; Etemad, 1999). According to Teo (2007), SMEs have constrained resources which limit their application of IT when compared to large firms.

Similarly, Bruque and Moyano (2007) advocate that SMEs face greater risks in IS implementation than large firms due to fewer resources and limited education about IS.

Many SMEs rely on a limited number of customers and a limited number of competitors and stress the importance of qualitative competitive factors such as personalised service, rather than cost and price factors (Cambridge Small Business Research Centre, 1992). SMEs are often less structured and less formal with fewer fixed procedures, perhaps because there has not been time to develop them or perhaps because resources are often scarce in SMEs (Wattanapruttipaisan, 2003). The generally flat structure of SMEs and fewer departmental boundaries normally result in a more flexible work environment (Ghobadian and Gallear, 1996). The evaluation, reward and reporting procedures in SMEs are also simpler than in larger companies. This could be because establishing a clear link between reward and behaviour in a small company with a flat structure may be simpler.

The planning process in SMEs is generally not formal and multi-functional planning usually takes place within the individual minds of managers. The extent of training and staff development in SMEs is also limited and informal, unlike large companies where there will normally be routine training schedules for both new and current members of staff (Rolle, 2008). This can be due to fewer and more multi-functional human resources, the lack of qualified human resources specialists and financial constraints in SMEs. Ghobadian and Gallear (1996) state that by being less structured and less formal, SMEs possess unique advantages in effective and open communication channels, low resistance to change, people orientation, employees employing a natural responsibility for quality, company-wide awareness and functional integration thus, allowing SMEs to respond promptly to market changes. In both directions, face to face communication is the norm in SMEs (Purhonen, 2007). Smallbone et al. (1993) argue that SMEs ability to respond to market changes is an essential prerequisite for their growth.

3.1.2 Significance of SMEs and their Contribution to Economic Development

It is widely recognised that SMEs are an important driving force of economic growth and job creation in both developed and developing countries (Tan and Macaulay, 2007; Ayanda and Laraba, 2011). Similarly, Mira (2006) confirms that SMEs play an important role in all the economies of the world. According to Mutula and Brakel (2007), SMEs are often seen as vital for the growth and innovation of dynamic economies as they create

employment. Also, Ariyo (1999) refers to SMEs as the backbone for the economic growth of most economies in terms of driving industrial development and increasing employment. Levy and Powell (2005) recognise SMEs as a vibrant and growing sector in most economies around the world. Other researchers (e.g. Golding et al., 2008 and Berisha-Namani, 2009), argue that SMEs play a fundamental role in national and regional economies by stimulating domestic and regional economic growth and are important agents for alleviating poverty in developing countries. Ongori (2009) states that SMEs are generally regarded as the cornerstone of both developed and developing economies as they help to diversify economic activities that have significant contribution to imports and exports and can adapt quickly to changing market demands. Similarly, Okongwu (2001) advocates that in developed and developing countries SMEs are recognised as the main source of economic growth and a major factor in promoting private sector development and partnership. Also, SMEs contribute to job creation, income generation and distribution especially in developing countries. They provide a breeding ground for entrepreneurs and employment (Ongori and Migiro, 2010). Taylor and Murphy (2004) consider SMEs to be major economic players and a potential source of national, regional and local economic growth while Al-Qirim (2003) ascertains that SMEs represent a viable source for innovations.

According to Wattanapruttipaisan (2003), the significance of SMEs for growth, productivity and competitiveness of the economies in both developed and developing countries is acknowledged universally, since SMEs bring about substantial local capital formation, contribute to improved living standards and achieve high levels of productivity. They are identified as a major means of achieving equitable and sustainable industrial diversification. Aina (2007) states that the contributions of SMEs to any economy are obvious, as SMEs are known to contribute to the development of several economies in terms of output of goods and services, the creation of jobs at a relatively low capital cost, especially in the fast growing service sector, and they provide a vehicle for the reduction of income disparities thus developing a pool of skilled or semi-skilled workers as a basis for future industrial expansion. SMEs are also known to improve forward and backward linkages between economically, socially and geographically diverse sectors of many economies and provide opportunities for development (SMEDAN, 2005). Ayanda and Laraba (2011) also note that the major advantage of the SME sector is its employment potential at low capital cost.

Meanwhile, Lukacs (2005) ascertains that in Singapore, 51% of the total workforce is employed in the small and medium size sector and, in particular, SMEs in the manufacturing sector account for 15% of GDP. Lukacs also states that SMEs account for the largest employers in Hong Kong with over 1.4 million people and in Japan 81% of the employment is in the SMEs sector. Ongori and Migiro (2010) maintain that in India SMEs have been consistently outperforming large companies on crucial parameters such as growth in production and growth in employment. Sharma and Bhagwat (2006) further state that the SME sector in India accounts for 40% of industrial production, 35% of total exports and provides about 80% of employment in the industrial sector. Asmelah (2002) asserts that the significant role played by SMEs in terms of development is acknowledged the world over. SMEs occupy an important and strategic place in economic growth and equitable development in all countries.

According to Abor and Quartey (2010), there is a general consensus that the contribution of SMEs is significant for both economic and social development. Kayanula and Quartey (2000) state that SMEs seem to have advantages over their large-scale competitors since they are able to adapt more easily to market conditions. They improve the efficiency of domestic markets and make productive use of scarce resources, thus facilitating long-term economic growth. SMEs are able to withstand adverse economic conditions because of their flexible nature and are more labour intensive than larger firms. Thus, SMEs have lower capital costs associated with job creation (Kayanula and Quartey, 2000). Similarly, Abor and Quartey (2010) say that SMEs are a major area of concern to many policy makers in an attempt to accelerate the rate of growth in low-income countries. As a result, these enterprises have been recognised as the engines through which the growth objectives of developing countries can be achieved which helps to confirm that SMEs are potential sources of employment and income in many developing countries including Nigeria.

3.1.3 SMEs in Developing Countries

SMEs speed up the rate of social economic development of many countries particularly developing countries (Ayanda and Laraba, 2011). The majority of SMEs in developing countries, especially in SSA, have been slow to reap the benefits of globalisation (Wignaraja, 2003). Ogunsiji and Kayode (2010) claim that many SMEs in developing countries face monumental challenges. Despite the lofty objectives of policies and practitioners, the results from SME programmes and policies are often disappointing and

the potential contributions that vigorous small-scale industry could make to development programmes are still not realised (Ogunsiji and Kayode, 2010).

In Africa, SMEs employ more than 40% of all new entrants to the labour force since they tend to be more labour intensive than large firms and are therefore, better placed to alleviate unemployment (Muuka, 2002). Yet, despite the claims of SMEs' success in the developed countries, Africa has yet to catch up. Asmelash (2002) in Onuorah (2009) comments that despite the "repeated public announcements about their assumed importance as instruments of development, SMEs in many African countries enjoy a lukewarm support. They lack effective organisation and knowledge of modern management techniques. Organisations created to promote SMEs are not sufficiently prepared for the task and the interference with policy-makers leaves much to be desired". Nevertheless, SMEs are acknowledged over the world as veritable enterprises responsible for creating employment opportunities, promoting inter- and intra-regional trade, breaking the monopoly of larger enterprises as well as alleviating poverty (Onuorah, 2009). In most cases, SMEs are established rapidly and put into operation to produce quick returns.

3.1.4 SMEs in Nigeria and their Characteristics

Nigerian SMEs account for about 70% of industrial employment (Adebusuyi, 1997) and well over 50% of the GDP (Odeyemi, 2003). Odeyemi (2003) describes Nigerian SMEs as a very heterogeneous group of businesses that operate in different sectors of the economy. However, SMEs in Nigeria are vulnerable and very few manage to survive due to the problems of finance, low sales, low profitability, high costs of doing business and labour market barriers (Olutunla and Obamuyi, 2008). A major characteristic of SMEs in Nigeria relates to ownership structure, which largely revolves around one-man or a family. Nigerian SMEs are predominantly owned by a sole proprietor or by partners (Onuorah, 2009). Ogunsiji and Kayode (2010) note that in Nigerian SMEs, the same manager/proprietor finds it difficult to raise short or long term capital from the organised capital market, but instead relies on personal savings or loans from friends, relatives or money lenders. Usually, the same manager/proprietor handles/supervises the production, financing, marketing and personnel functions of the enterprise. The manager/proprietor's vision is mostly confined to the local community in which the business operates and there is generally little or no knowledge of the wider or distant markets (Ogunsiji and Kayode, 2010).

Furthermore, Ogunsiji and Kayode (2010) state that the rate of business mortality amongst Nigerian SMEs is high probably because of a strong mutual distrust and the dominance of the sole proprietor which militates against the formation of partnerships or limited liability companies. The enterprise is generally poorly equipped as the small scale industrialist feels reluctant to accept outside help owing to prejudice or fear that information about the enterprise might reach the tax authorities or a nearby competitor. Moreover, little or no account of business costs or revenue is kept and the banking system is hardly utilised. The result is that banking facilities for business financing and expansion are extended to only very few industrialists. Likewise, the level of education of the proprietor is usually very low with low levels of business management techniques, skills or market information (Ogunsiji and Kayode, 2010).

Similarly, Onuorah (2009) identifies some characteristics of SMEs in Nigeria such as labour–intensive production processes, limited access to long term funds, high cost of funds as a result of high interest rates and bank charges, high business mortality rate especially within their first two years, over-dependence on imported raw materials and spare parts, poor inter and intra-sectoral linkages, poor managerial skills due to their inability to acquire skilled labour, poor product quality output, absence of research and development, little or no training and development for staff, poor documentation of policies and strategies, low entrepreneurial skills, inadequate educational or technical background, lack of adequate financial record keeping, poor capital structure, poor management of financial resources and inability to distinguish between personal and business finance, high production costs due to inadequate infrastructure and wastages, use of out-dated and inefficient technology, lack of access to international market, lack of succession plan, and poor access to vital information amongst others (Onuorah, 2009).

3.1.5 Economic contribution of SMEs in Nigeria

SMEs in Nigeria are engines of economic growth and a major factor in promoting private sector development and partnership (Udechukwu, 2003). It is well known that SMEs' development is an essential element in the growth strategy of most economies. The contributions of SMEs to the Nigerian economy are not contestable as about 10% of the total manufacturing output and 70% of the industrial employment are by SMEs. Nigerian SMEs help to promote industrial and economic development through the utilisation of local resources and are responsible for the production of intermediate goods and the transformation of rural technology (Aina, 2007). They are generally acknowledged as the

bedrock of industrial development. SMEs in Nigeria not only provide employment and income for the majority of the country's citizens but are also recognised as the breeding ground for domestic entrepreneurial capabilities, technical skills, technological innovativeness and managerial competencies for private sector development (SMEDAN, 2005, Aina, 2007). Currently in Nigeria, SMEs help in promoting the growth of the country's economy, hence Ojukwu and Georgiadou (2005) refer to Nigerian SMEs as the cornerstones on which Nigeria's economic growth and stability rests. Similarly, Udechukwu (2003) states that SMEs are known to be labour intensive and SMEs in Nigeria account for well over half of the total share of employment. The Federal Office of Statistics reveals that about 97% of the entire enterprises in Nigeria are SMEs which employ an average of 50% of the working population as well as contributing up to 50% of the country's industrial output (Ihua, 2009). According to Ogechukwu (2006), SMEs have contributed greatly to Nigeria's development by the provision of employment, marketing of goods and services, and the growth and development of rural areas. SMEs have also contributed immensely to the growth of indigenous entrepreneurship in Nigeria.

3.1.6 Government Support Programmes for SMEs in Nigeria

Many governments design programmes of assistance to enhance the developments of SMEs. These are usually in the areas of finance, extension and advisory services, training and provision of infrastructural facilities and so on. A number of international agencies have attempted to work towards the realisation of sustainable SME developments in Nigeria (Anyawu, 2003; Olorunshola, 2003), especially in the area of access to institutional finance as it has remained a problem for the development of the Nigerian sub-sector. Also, the Nigerian government, in realisation of the vital contributions of SMEs to the attainment of the nation's economic development objectives, has created a number of schemes to support this sub-sector (Ayodeji and Balcioglu, 2010). Some of the schemes that have been established by the Nigerian government to support SMEs' developments in Nigeria are geared towards improving accessibility and availability of credit to these SMEs. These include:

The Small and Medium Equity Investment Scheme (SMEIS) was created in 2001. It is a funding scheme for Nigerian SMEs which expects banks to set aside 10% of their profit before tax to finance the sector (Owoseye, 2010). The objectives of the scheme include facilitating the flow of funds for the establishment of new SMEs and reactivation,

expansion or restructuring of on-going projects in the SME sub-sector, stimulating economic growth, developing local technology, generating employment and managing and stimulating corporate governance in the SMEs (Aruwa and Gugong, 2007). The activities targeted under this scheme include agro-allied, information technology, telecommunications, manufacturing, educational establishments, services, tourism and leisure, solid minerals and construction (Anyawu, 2003; Olorunshola, 2003). The implementation of the scheme generated research interests from both academia and the regulatory authorities. However, interest generated has raised concerns about its performance (Aruwa, 2005), assessment of stakeholders' responsibilities (Salami, 2003) and the critical success factors of SMEIS (Osa-Afiana, 2003). The concepts of equity financing and its implication for SMEIS have also received attention (Oyekanmi, 2003). The scheme was suspended in March 2008 due to complaints about lack of access to the funds (Owoseye, 2010).

The Nigerian Agricultural Cooperative and Rural Development Bank (NACRDB) is a bank primarily responsible for financing SMEs in the agricultural sector. The Bank's mandate encompasses savings mobilisation and the timely delivery of affordable credit to meet the funding requirements of the teeming Nigeria population in the agricultural and non-agricultural sectors of the national economy. The NACRDB is structured to accept deposits and offer loans to Nigerians for their business and offers a number of financial products including target savings, start-ups as well as smallholder loan schemes (Anyawu, 2003).

The Bank of Industry (BOI) mostly assists local and foreign entrepreneurs to establish new industries as well as expand and modernise existing ones. BOI is the foremost long-term industrial financing institution in Nigeria (BOI, 2011). The principal objective of this bank is to provide the necessary financial assistance and incentives for the establishment of large, medium and mostly small scale projects and the expansion and diversification of existing industries. It engages in fund mobilisation, project appraisals, financing, implementation and investment activities (Ogechukwu, 2006).

There is also the Refinancing and Rediscounting Facility which was introduced by the central bank of Nigeria in 2002, to support short and long term bank loans for SMEs at a concessionary interest rate. The facility was instituted to provide liquidity to banks in

support of their financing of real sector activities. This was in recognition of the fact that aggregate credit by depositing money in the banks was mainly short term and as such loans were channelled mainly to general commerce and trade (Anyawu, 2003).

Other initiatives and incentives put together by the Nigerian government for the development of SMEs include the Industrial Development Centres (IDCs), which provide extension services to the SMEs in areas such as project appraisal for loan application, training of entrepreneurs, managerial assistance, product development, production planning and control as well as other extension services. There is also the Small Scale Industries Credit Scheme (SSICS) that provides technical and financial support for SMEs and the Nigerian Export Import Bank (NEXIM) which provides finance, risk mitigating facilities and trade information as well as advisory services to Nigerian exporters. The Nigerian Bank for Commerce and Industry (NBCI) was also set up to develop national enterprise on a small and medium scale, as well as the Nigerian Industrial Development Bank (NIDB) which was set up to provide credit and other facilities to industries, particularly medium and large scale enterprises. However, some small scale enterprises have also benefited from its financing (Sanusi, 2003).

Furthermore there is the National Economic Reconstruction Fund (NERFUND) that was set up as a funding mechanism aimed at bridging the gap in the provision of local or foreign funds to SMEs and also the National Directorate of Employment (NDE), which is designed to implement programmes that will combat mass unemployment. Others include the World Bank assisted SME II loan project, the state Governments and some other international financial assistance (Sanusi, 2003).

Nonetheless, the various measures embarked upon to ensure the growth and developments of SMEs in Nigeria have witnessed limited success despite their invaluable contributions to economic development and the government's effort to promote the sub-sector. This is as a result of a plethora of problems that have beset the development of Nigerian SMEs. Some of the problems include inadequate infrastructural facilities, continued restricted access to credit as well as abuse of the various programmes by both the beneficiaries and the operators arising from insincerity of purpose, amongst others. Ojo (2003) states that all the support programmes have failed to promote the development of SMEs.

Mambula (2002) notes that since independence, the Nigerian government has been spending large amounts of money obtained from external funding institutions for entrepreneurial and small business development programmes, which have generally yielded poor results. Unfortunately, these funds hardly ever reach the desired businesses as they may be lost, due to bureaucratic bottlenecks and end up in the accounts of public office holders (Mambula, 2002; Mambula, 2004). Despite these setbacks, the role of SMEs in Nigeria cannot be ignored since they play a major role in the country's economic development. Onuorah (2009) states that Nigeria remains a country with very high potential but an equally high inertia to develop. Nigeria has the largest market in the African continent where investment opportunities are beckoning to be exploited yet SMEs in Nigeria are faced with so many constraints. Thus, Ayodeji and Balcioglu (2010) stress that Nigerian SMEs' contributions to the industrialisation process are still generally low when compared with many countries.

3.1.7 SME Constraints

SME development is hampered by a number of factors. Blili and Raymond (1993) note that the problems encountered by smaller firms are different from those encountered by large firms hence require different managerial approaches. Cook and Nixson (2000) observe that SMEs development is always constrained by the limited availability of financial resources to meet a variety of operational and investment needs. Abor and Quartey (2010) also found that there is limited access to financial resources available to smaller enterprises as compared to larger organisations. The role of finance has been viewed as a critical element for the development of SMEs. According to Auger and Gallaugher (1997), SMEs are more vulnerable due to their lack of financial and human resources as well as information resources. Similarly, Lawrence (2009) states that SMEs are often weak in terms of financing, planning, control and training as a result of a lack of resources.

In developing countries, despite the potential role of SMEs to accelerate growth and job creation, a number of bottlenecks still affect their ability to realise their full potential (Abor and Quartey, 2010). Issues such as finance, lack of managerial skills, equipment and technology, regulatory issues, and access to international markets have been identified by researchers (e.g. Mpofu et al, 2009; Apulu and Latham, 2009; Abor and Quartey, 2010, amongst others). According to Abor and Quartey (2010), a large portion of the SME sector

does not have access to adequate and appropriate forms of credit, equity or financial services. These authors stress that the lack of managerial skills places significant constraints on SMEs' development and further state that although SMEs tend to attract motivated managers, they can still hardly compete with larger firms. Kayanula and Quartey (2000) comment that the scarcity of management talent prevalent in most developing countries has a magnified impact on SMEs. Besides, the lack of support services or their relatively higher unit cost can also hamper SMEs' efforts to improve their management because consulting firms are often not equipped with appropriate cost-effective management solutions for SMEs (Abor and Quartey, 2010). Although there are numerous institutions providing training and advisory services in developing countries, there is still a skills gap in the SME sector as a whole. This is because entrepreneurs cannot afford the high cost of training and advisory services while others do not see the need to upgrade their skills due to complacency (Kayanula and Quartey, 2000).

Similarly, Ojo (2009) comments that over two and half decades, governments of developing countries have formulated great programmes for economic development. According to the Ojo, a possible explanation for the relative absence of SMEs in the poor economies is the difficulty of obtaining access to finance. Large firms in these countries can secure financial assistance because they have assets that can serve as collaterals for loans. Therefore, the availability of new ideas and the ability to seek opportunities are essential if small businesses are to remain flexible and have competitive advantage. Poon and Swatman (1995) infer that the criteria for the survival and success of SMEs is reliant on their ability to remain flexible and innovative.

3.1.8 SMEs' constraints in Nigeria

In Nigeria, the majority of SMEs give up their businesses within their first five years of establishment and a smaller percentage of these SMEs go into extinction between the sixth and tenth year. As a result, only about 5-10% of young SMEs survive, thrive and grow to maturity (Onuorah, 2009). Similarly, Adelaja (no date) comments that SMEs have the problem of lack of continuity whereby in most cases, immediately the owner, proprietor or entrepreneur dies or loses vision or commitment, most small-scale enterprises die. Most entrepreneurs do not have the required management expertise to carry through once the business starts growing. Olorunshola (2003) describes the challenges facing Nigerian SMEs as enormous and states that this includes inadequate and inefficient infrastructural

facilities as well as costs of operation. Consequently, Onuorah (2009), Olorunshola (2003) and Ayanda and Laraba (2011), identify insufficient capital as traceable to the reluctance of banks to give out loans to Nigerian SMEs and therefore a hindrance to their development. Also, there is the issue of lack of adequate credit for SMEs in Nigeria, which is due to poor documentation of project proposals as well as inadequate collateral by SME operators.

Most SMEs in Nigeria suffer from poor accounting systems, thus they lack proper assessment of their performances thereby affecting their standards. This creates an opportunity for mismanagement and eventually leads to the downfall of the establishment **(**Ayanda and Laraba, 2011). Onugu (2005), further identifies lack of focus, inadequate market research, over-concentration on one or two markets for finished products, lack of succession plan, inexperience, lack of proper book keeping, lack of proper records or lack of any records at all, inability to separate business and family or personal finances, lack of business strategy, inability to distinguish between revenue and profit, inability to procure the right plant and machinery, inability to utilise/access modern technology, inability to engage or employ the right calibre of staff, amongst others, as constraints encountered by Nigerian SMEs.

There is also the problem of weak demand for products arising from low and dwindling consumer purchasing power and lack of patronage for locally produced goods by those in authority (Olorunshola, 2003). Bureaucratic bottlenecks and inefficiencies usually discourage many Nigerian SMEs rather than promote their growth. In addition, there is the incidence of multiplicity of agencies and taxes which often result in the high cost of doing business (Ihua, 2009), and poor management practices and low entrepreneurial skills arising from inadequate educational and technical background (Olorunshola, 2003; Onuorah, 2009).

According to Onuorah (2009), other challenges which SMEs face in Nigeria include non-adoption of technology for enhanced business processes, unfavourable fiscal policies, fuel crises or shortages, inconsistent policies, difficult access to funding, poor policy implementation, restricted market access, raw materials sourcing problems, competition with cheaper imported products, problems of inter-sectorial linkages given that most large scale firms source some of their raw material abroad instead of subcontracting to SMEs,

insecurity of people and property, fragile ownership base, lack of requisite skill and experience, thin management, unfavourable monetary policies, lack of preservation, processing and storage technology and facilities, lack of entrepreneurial spirit, poor capital structuring as well as poor management of financial, human and other resources (Onuorah, 2009).

Additionally, Olutunla and Obamuyi (2008) state that accessibility to formal financial systems by Nigerian SMEs is very limited. On the supply side, banks are not expanding SMEs' loans due to imperfect information, high transaction cost of dealing with small loans, geographical dispersion of the SMEs and large number of borrowers and low returns from investment. On the demand side, SMEs are reluctant to obtain loans because of the collateral security, high interest rate and untimely delivery of credits. Olutunla and Obamuyi (2008) highlight that the problem of finance amongst Nigerian SMEs has persisted for a long time, despite the existence of various economic reform programmes by the government aimed at developing the sector. Ogunsiji and Kayode (2010) stress that inadequate finance is considered to be one of the most worrying issues amongst SMEs in Nigeria.

Similarly, the Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) has identified the problems facing Nigerian SMEs, such as low market access to credit, poor information flow, discriminatory legislation, poor access to land, weak linkages among different sectors, weak operating capabilities in terms of skills, lack of knowledge and attitudes, lack of infrastructural facilities amongst others (SMEDAN, 2005). According to SMEDAN (2005), SMEs in Nigeria cover the entire range of economic activity within all sectors and share a number of common problems. A major constraint among Nigerian SMEs is their inability to meet up with the challenges of competitiveness due to inadequate technologies. Kuteyi (2009) also mentions that the non-utilisation of ICT, amongst other factors, affects the development of SMEs in Nigeria.

3.2 Information and Communication Technology (ICT)

ICT is fast becoming one of the main drivers of change in organisations (Adebambo and Toyin, 2011). ICT has been defined in chapter one as any technology that facilitates communication and assists in capturing, processing and transmitting information electronically (Apulu and Latham, 2009c). In other words, ICT is simply a wide range of

computerised technologies. Ritchie and Brindley (2005) describe ICT as "the array of primarily digital technologies designed to collect, organise, store, process and communicate information within and outside an organisation". Also, Barba-Sánchez et al. (2007) view ICT as a collective term for a wide range of software, hardware, telecommunications and information management techniques, applications and devices, that could be used to create, produce, analyse, process, package, distribute, receive, retrieve, store and transform information. Davenport (1993) refers to ICT as an enabler of organisational change. In contrast, Apulu and Latham (2009c) describe ICT as a tool that brings about competitive advantage which in turn, helps to deliver business value in organisations.

Heeks (1998) states that ICT has almost the same meaning as IT but emphasises that ICT or IT is different from Information Systems (IS). Heeks (1998) further defines IT as "computing and telecommunications technologies that provide automatic means of handling information" while information systems are defined as "systems of human and technical components that accept, store, process, output and transmit information". Peppard (1993) argues that some literature use the terms IS and IT interchangeably even though they may not necessarily mean the same. According to Laudon and Laudon (2006), information systems are "a set of interrelated components that collect (or retrieve), process, store, and distribute information to support decision making and control in an organisation whilst information technology refers to all the hardware and software that a firm requires, in order to achieve its business objectives". This implies that there is a close link between IT and IS since one depends on the other. IT will be of no value if it is not linked to IS thus, for IS to succeed it requires IT.

Similarly, in business, ICT is often classified into two broad types of product; the traditional computer-based technologies and the sophisticated/advanced or more recent and fast-growing range of digital communication technologies that allow people and organisations to communicate and share information digitally (Dai, 2009; Xuesong, 2009). More recent technologies have enabled organisations to share and disseminate information between various users simultaneously, customise functionality and achieve higher levels of interactivity (Maneche and Schoensleben, 2004). Recent technologies are also more sophisticated and help organisations to reduce their operational costs, enhance customer service levels and satisfaction, thereby providing higher quality of information for better

decision making by managers. According to Apulu and Latham (2011b), the rapid development of ICT has changed the conventional way of conducting businesses in many organisations, while Erumban and de Jong (2006) advocate that ICT has created a revolution by making the world seem smaller and improving potential economic growth.

3.2.1 Benefits of ICT

The benefits of ICT cut across all sectors of the economy and all fields of human activities. ICT is said to improve the standard of living and enhance business operations as well as organisational efficiency (Udo and Edoho, 2000; Ion and Andreea, 2008). Fullanteli and Allegra (2003) state that ICT offer enterprises a wide range of possibilities for improving their competitiveness. It is commonly accepted that ICT offers many potential benefits to organisations so as to make them more efficient, effective and competitive (Fink and Disterer, 2006). Niamsorn et al. (2011) state that ICT has transformed and changed the way people work and communicate in organisations. According to Ion and Andreea (2008) ICT enables companies to communicate, collaborate and conduct transactions internally with their customers and suppliers, as well as distributors via the internet. ICT also allows companies to obtain and process, accumulate and exchange information. Ion and Andreea (2008) and Apulu and Latham (2011c) comment that with ICT, organisations can exchange real-time information and build closer relationships with their customers, suppliers and business partners. Also, customers can receive immediate feedbacks that allow companies to react faster to customers' changing demands and to recognise new market niches.

According to Fullanteli and Allegra (2003), ICT provides mechanisms for gaining access to new market opportunities and specialised information services such as distance consulting, continuous training, new advisory modes, and so on. This implies that organisations that are able to exploit the potentials offered by ICT can handle innovative processes such as Supply Chain Management (SCM), Customer Relationship Management (CRM) and Knowledge Management (KM) more effectively (Fullanteli and Allegra, 2003). Modimogale and Kroeze (2009) state that ICT can fulfil a number of business needs such as strategic, operational and marketing needs or a combination of all of them. Manecke and Schoensleben, (2004) argue that ICT is vital for a company's external relationships, particularly the cross-company workflow. It also helps in sending and retrieving information both within and across diverse organisations and has contributed significantly to the closing of communication gaps (Mouelhi, 2008).

According to Brynjolfsson and Hitt (2000), the use of ICT can help to cut down the costs of coordination, communication, information processing and also enable efficient service provision at lower cost. Sewanyana (2009) describes ICT as a strategic tool that enables users to become efficient and effective. Kajogbola (2004) argues that users and suppliers can now communicate more easily and faster with the use of ICT, such as by electronic mail (E-mail). ICT provides quicker responses to market needs and allows more flexibility in product design, production and equipment delivery. In addition, ICT opens more opportunities for training, and the re-training of existing staff in the mastery of the new and sophisticated equipment (Mouelhi, 2008). In other words, the use of ICT has led to the acquisition of additional capabilities by employees in many organisations.

Moreton and Chester (1997) stress that there are some organisational initiatives that is impossible to realise without the use of ICT. It provides an unparalleled method of processing, analysing and communicating the information from both inside and outside business which is needed to detect and understand the patterns and pace of change. Moreton and Chester (1997) further state that ICT has the potential to assist businesses enormously by supporting the drive for increased customer satisfaction and enabling the streamlining of business processes (including links to suppliers and customers). Also, Lefebvre and Lefebvre (1996) identify the sociological and psychological impacts of ICT on employees in the workplace. Hence, Mouelhi (2008) concludes that the introduction of ICT applications in a firm has impacts on work-group effectiveness, organisational climate, job satisfaction, personal growth and accomplishments.

3.3 ICT Adoption in SMEs

Adopting new technologies is very important in initiating the movement towards higher quality and competitiveness in the world of SMEs (Turan and Ürkmez, 2010). Dyerson et al. (2009) claim that the adoption and use of ICT is widely seen as critical for the competitiveness of SMEs in the emerging global market and has resulted in more effective use of time. According to Hazbo et al. (2008), the role of ICT is crucial to SMEs as ICT has become a major catalyst and enabler of organisational change. Chibelushi (2008) states that ICT can provide opportunities for business transformations. Jennex et al. (2004) also note that ICT can provide SMEs with the opportunity to conduct business anywhere. According to Evans and Wurster (1997), ICT increases richness and reach. This refers to the way companies communicate, collaborate and conduct transactions with their

customers, suppliers and distributors via the internet and the ability for local SMEs to participate in the digital economy (Golding et al., 2008). Moreover, Ashrafi and Murtaza (2010) identified that ICT helps SMEs to enter new markets, supply new products and services, increase their added value, change business processes, increase performance and productivity of the organisation, employ new business channels and provide a rapid response to competitors' activities.

Pavic et al. (2007) argue that SMEs have the opportunity to achieve a competitive advantage from advances in ICT through innovation, marketing, efficiency gains, better quality and customer responsiveness. Likewise, Levy et al. (2002) found that SMEs can act proactively in relation to the use of ICT. Other researchers (e.g. Hagmann and McCahon, 1993; Yetton et al., 1994) have discovered that SMEs tend to deploy ICT in a reactive, cost reducing manner. According to Frempong (2007), the contributions of ICT to business development have been pervasive, hence it is becoming increasingly difficult for companies to compete effectively in the world market without adequate ICT infrastructures and this applies to SMEs as well. In addition, the use of ICT enables SMEs to partake in the knowledge economy and offers enormous opportunities to narrow the social and economic inequalities that will assist SMEs in achieving broader development goals (United Nations, 2007).

3.3.1 Benefits of ICT in SMEs

The use of ICTs can provide several significant benefits to SMEs, as identified by the United Nations (2007) which include increasing productivity in the production process, enhancing and increasing the efficiency of internal business operations, connecting SMEs more easily and cheaply to external contacts whether locally or globally, improving inventory management systems, decreasing wastage in production processes, improving communication between different departments within a firm, improving accounting and budgeting practices, reducing communication costs and geographic barriers with global suppliers and clients, expanding client base through e-marketing (e.g. websites, portals and mailing lists), linking to local and global supply chains and outsourcing opportunities, sharing and learning new business practices, facilitating capacity-building of owners and employees through e-learning platforms, simplifying government services such as business registration and filing of taxes, as well as introducing new methods of payment through e-commerce.

Also, Lal (2005) notes that web-enabled services increase the competitiveness of SMEs as ICT helps to change the relationship with customers by creating a stronger link between firms and clients. Golding et al. (2008), highlight that local SMEs are able to participate in the digital economy via the use of ICT. Furthermore, appropriate use of ICT can assist SMEs to gain competitive advantage by reducing costs and improving core business processes.

The European Commission (2008) states that ICT can assist SMEs to grow and become more innovative and hence suggests that the use of ICT in SMEs should be encouraged. It can help to improve technical and managerial skills making available e-business solutions for SMEs and addressing the high cost of ownership of ICT equipment. Furthermore, Love et al. (2004) ascertain that the use of ICT provides many benefits to SMEs at different levels (operational, tactical and strategic). In addition, Ongori (2009) infers that the adoption of ICT would change the way businesses operate in the present era of globalisation by changing business structures and increasing competition, thus creating competitive advantage for businesses and also changing business operations. Consequently, for SMEs to grow and become successful, they must have the ability to compete and dynamically respond to rapidly changing markets. This means that SMEs would need to adopt ICT and connect to the digital marketplace.

3.4 ICT Adoption in Developing Countries

A number of researches have been conducted on the adoption of ICT in both developed and developing countries (e.g. Ritchie and Brindley, 2006; Arendt, 2008; Hazbo et al., 2008; Harindranath et al., 2008b; Ongori, 2009; Mpofu et al., 2009). However, this section concentrates on ICT adoption on developing countries since the country under investigation is referred to as a developing country. Kamel (1995) conducted a study on ICT adoption in Egypt and identified ICT as a tool for socio-economic and cultural development. Hassan (1998) also conducted a study on ICT in Pakistan and proposed a framework for the IT industry development in Pakistan. Furthermore, Harindranath and Libenau (1995) conducted a research on issues affecting the Indian software industry with regard to changing State policy and increasing liberalisation in the Indian economy. Straub et al. (2001) also developed a model for the transfer of IT to the Arab world and highlighted the importance of transferring IT to developing countries. The study was able to assess the cultural influence of the Arab world with regard to transferring IT. Heeks

(2008) conducted a research on ICT based enterprises in developing countries and concluded that ICT in developing countries can be analysed at various levels. Nonetheless, Ashrafi and Mutarza (2010) suggest the need for more studies on ICT adoption in developing countries.

Sulaiman (2010) states that ICTs are expanding the possibilities for developing economies to participate in international markets. The internet, for instance, has changed the method in which goods and services are processed, delivered, sold and purchased. In other words, ICT has led to an ever growing number of people and businesses connected digitally**.** In the 21st century, ICT is regarded as an essential tool for businesses both in developed and developing countries. This is because ICT can assist businesses to remain competitive in both domestic and international markets (Kew and Herrington, 2009).

The diffusion of ICT in many countries by different sectors of the economy has been found to have a direct, positive impact on organisational efficiency and has played a role in the rapid development of these countries (Achimugu et al., 2009). Sahlfeld (2007) states that there is no indication that the benefits of ICT experienced by developed countries, such as reduced business costs and increased access to information, would not also amass to that of developing countries. According to Sahlfeld (2007), the main importance of ICT to businesses in developing countries is to access timely and accurate information regarding the supply of and demand for products and services in various markets. Meanwhile, some researchers have focussed their attention on how ICT may promote development in developing countries. For example, the Parliamentary Office of Science and Technology (2006) has identified that ICT can help developing countries tackle a wide range of health, social and economic problems by improving access to information and by enabling communication. ICT can also play a role in reaching millennium development goals such as the elimination of extreme poverty, combating serious disease and achieving universal primary education and gender equality. Similarly, the OECD (2004) growth study concluded that ICT is a key input to productivity and growth performance. However, the benefits of ICT are still not fully realised in many countries, as ICT is often out of reach to the poor and those in rural areas.

Terero and von Braun (2005) observe that although the use of ICT remain concentrated largely in the developed world, nonetheless ICT diffusion is beginning to reach developing

countries including the poor rural areas, bringing with it high hopes of positive development outcomes. While technological innovations such as mobile phones and wireless broadband access are playing an important role in building ICT levels globally, strong inequality still remains. Developing countries are still well behind developed countries in access to ICT (Terero and von Braun, 2005). Al-Shaikh (1998) notes that the "technological environment and the infrastructure of developing countries are still lagging behind the Western Countries". Ihua (2009) states that developing countries are lagging behind, probably because the developed nations produce the technology, while the developing nations import it. Also, Beekhuyzen et al. (2005) note that access to ICT continues to be a global problem especially in developing countries. This shows that countries are digitally divided due to lack of access and availability of ICT. Mouelhi (2008) advocates that the adoption of ICTs, such as internet, mobile telephony and broadband networks, in many developed countries has been found to have a positive effect on organisations' performance, yet not all countries are taking advantage of the revolution in the same way and at the same pace.

The World Bank report (2006) confirms that "firms which use ICT grow faster, invest more, and are more productive and profitable than those that do not". Many studies that cover the experience of developed countries conclude that there is a positive relationship between the use of ICT and performance (Baldwin and Sabourin, 2001). According to Mouelhi (2008), the greatest benefits of ICT are realised when ICT investment is combined with other organisational changes and human capital upgrade. Also, Obijiofor et al. (2005) perceive ICT to be a major tool for kick-starting ailing economies and consequently in assisting developing societies to 'catch up' with the developed world. Still, Golding et al. (2008) affirm that there is a digital divide which shows that ICT adoptions vary between developed and developing countries with developing countries adopting ICT at a slower rate due to several factors militating against them.

3.4.1 Factors affecting ICT Adoption in Developing Countries

A developing country is described as a country in which most people have a low income and low standards of living with less access to goods and services as compared to most people in higher-income countries (Leslie and Gaskill, 2006). Developing countries face almost insurmountable barriers to accessing the electronic highway (Kapurubandara and Lawson, 2008). The problems of ICT in developing countries have been grouped into

several categories. Some researchers have attributed these problems to organisational factors, environmental factors and lack of technical skills, amongst others. However, Okot-uma in Kunda and Brooks (2000) suggests that the problems of introducing ICT such as e-commerce in developing countries can be classified into three generic categories: contextual, strategic and operational.

Contextual problems are the result of a poor match of models of developed countries' designs and applications to the developing countries context. Strategic problems relate to local, national and regional policy initiatives. Operational problems are faced by developing countries due to technical and economic constraints which include the non-existence of reliable background statistical information and inadequate capital to finance ICT and lack of skilled personnel (Kunda and Brooks, 2000). The issue of a deficiency of skilled human resources, economic constraints, system infrastructure deficiencies and application problems are also regarded as factors that affect developing countries in their quest to adopt ICT. Woherem (1993) states that the lack of skilled human resources is a principal barrier blocking the diffusion and effective utilisation of ICT in developing countries. Nonetheless, several developing countries suffer from both a lack of resources and a limited domestic market.

Meanwhile, some developing countries import ICT due to lack of indigenous ICT industries. According to Kunda and Brooks (2000), scarcity of foreign currency makes developing countries depend upon donor agencies for much of their ICT imports. Kari (2007) states that much of the developing world still lacks the most basic forms of information and communication infrastructure. Kapurubandara and Lawson (2006) consider the lack of telecommunication infrastructures, such as poor internet connectivity, lack of fixed telephone lines for end user dial-up access, and the underdeveloped state of the Internet Service Providers (ISPs), as factors affecting the proper utilisation of ICT such as e-commerce, in a developing country such as Sri Lanka.

In developed countries, ICT has been used to change the manner in which businesses are conducted in order to have some forms of strategic advantage. Iacovou et al. (1995) and Mehrtens et al. (2001) argue that not all organisations are strongly inclined towards adopting ICT. Premkumar et al. (1994); Iacovou et al. (1995); Crook and Kumar (1998); Payton (2000) and Beatty et al. (2001) state that the extent of ICT adoption depends on the

attitude of the organisation towards ICT technologies and the inclination or the propensity to deploy and use them. However, some authors (e.g. Davis et al., 1989; Rogers, 1995; Venkatesh and Davis, 2000) argue that these findings match studies on the individual acceptance of technology and the diffusion of innovations in organisations (Cooper and Zmud, 1990).

Therefore, Tarafdar and Vaidya (2006) recommend that understanding the fundamental factors behind the differences in organisational inclination with regard to technology adoption is essential, to enable organisations to assess the extent to which they are inclined to develop, deploy and use technologies. According to Ginsberg and Venkatraman (1992), different managers and organisations adopt different attitudes towards ICT depending on its perceived usefulness in the context of their work and organisational norms regarding the acceptance of new ICT.

Checchi et al. (2003) and Roztocki et al. (2004) state that there is an imbalance of scholarly studies in the area of understanding the role of ICT in developing countries. Also, Prasad (2009) asserts that the lack of scholarly focus tends to hinder the development and use of ICT in developing countries since businesses lack the vital information that could provide directions for the successful use of ICT. Weiner and Rumiany (2007) further state that the implementation of ICT in the developing world is often inhibited because the infrastructure, human capital development and financial resources that are necessary to implement ICT effectively, are either absent or of a poor quality. They argue that ICT policies adopted in developing countries have the ability to increase (rather than decrease) the digital divide within countries, and in so doing make it even more difficult for businesses in rural areas to compete. They justify this point by arguing that when new technology is introduced in developing countries, it is usually made available in urban areas that have the required infrastructure and market, thereby making those areas become more competitive. With the rapid advances in technology there is a growing fear that rural areas, which are already hampered by large distances from markets and plagued with poorer quality infrastructure, will be further disadvantaged by their lack of ICT (Kew and Herrington, 2009).

3.5 Factors affecting ICT Adoption in SMEs

Large organisations have enough resources to adopt ICT while on the other hand SMEs have limited financial and human resources to adopt (Ashrafi and Murtaza, 2008). Duan et al. (2002), in their study, identified the lack of ICT skills and knowledge in SMEs as one of the major challenges faced by all European countries, particularly in the UK, Poland and Portugal. Also, Shiels et al. (2003) observed that the characteristics of the firm and industry sector are contributing factors to the adoption and exploitation of ICTs by SMEs.

Costello and Sloane (2003) and Kapurubandara and Lawson (2006) state that SMEs are hindered from adopting ICT due to the impediments that arise as a result of the many barriers in the organisation. Kapurubandara and Lawson (2006) refer to these impediments as internal and external barriers. Internal barriers can further be categorised into individual (owner-manager) and organisational (cost and return on investment). On the other hand, SMEs are inhibited by a different set of impediments that arises due to the lack of infrastructures, and technological, economic, political, legal, social and cultural barriers which exist in a country and are referred to as external barriers. Furthermore, Kapurubandara and Lawson (2007) refer to external barriers as barriers that cannot be resolved by the SME since SMEs have no control over these barriers and are compelled to work within the constraints, for example inadequate telecommunication infrastructures. Similarly, Iyanda and Ojo (2008) argue that internal barriers include employees and management; however, SMEs have control of and the ability to change the internal factors within the organisation, for example, lack of time or resources and lack of awareness on the part of the owner/manager.

Consequently, Ongori (2009) states that ICT adoption in SMEs is faced with challenges such as a lack of ICT technical and managerial capacity, human resources, and comprehensive legal framework, as well as language barriers and a lack of confidence and trust in new technologies. Stockdale and Standing (2004) highlight that the barriers to ICT adoption by SMEs include the cost of adoption and lack of understanding of the realisable benefits. Nonetheless, Kapurubandara and Lawson (2006, 2007) comment that some of the barriers associated with SMEs can be addressed by SMEs working together, irrespective of the industry sector, to form clusters and share expenses, resources and facilities. Alternatively, SMEs from the same industry sector can work together to address some external barriers where governmental intervention may be required. Thus, Kapurubandara

and Lawson (2006) suggest that for SMEs to successfully adopt technologies, internal and external barriers need to be addressed. They stress that internal barriers that arise within SMEs should be resolved in the organisation but these SMEs may have to work within the constraints of the external barriers since these are beyond their control and may need governmental intervention. This implies that it is vital to understand the barriers that inhibit SMEs in developing countries and how SMEs could overcome these barriers if they are to reap the benefits of ICT.

According to Costello et al. (2007), ICT adoption success determines business success. However, they advise that in order for ICT adoption to be realised, SMEs would need to have appropriate knowledge in the area, invest in the latest technology, have proficient consultancy, invest in modern IT infrastructure which ensures efficient business processes, and also have employees with the required technical knowledge and skills.

3.5.1 Factors affecting ICT Adoption in SMEs in Developing Countries

In developing countries, the majority of businesses are SMEs. They are regarded as the major source of income, a breeding ground for entrepreneurs and providers of employment (Mutula and Brakel, 2007). SMEs dominate the economy of several countries (Kapurubandara and Lawson, 2006). Despite the fact that SMEs play an important role in developing countries' economies, ICT adoption in SMEs is still relatively low when compared to developed countries (Alam et al., 2007). It seems that less attention has been paid to SMEs and ICT research in developing countries with their different economic, political, and cultural circumstances (Kapuruandara and Lawson, 2006).

Factors such as owner/manager characteristics, the role of top management, firm characteristics, costs and return on investment, lack of adequate telecommunication infrastructures such as poor internet connectivity, lack of fixed telephone lines for end-users, dial-up access and the underdeveloped state of the Internet Service Providers (ISPs) have been identified by Kapurubandara and Lawson (2006) as problems that hinder SMEs' adoption of ICT in a developing country, such as Sri Lanka. Similarly, Kunda and Brooks (2000) focus on the issue of systems infrastructure deficiency and application problem. Also, in most developing countries there are still the problems of irregular electric power supplies and cultural barriers. A survey conducted by Lal (2007) on globalisation and the adoption of ICT in Nigerian SMEs discovered that poor physical infrastructure is a major

factor inhibiting ICT diffusion. Asrafi and Murtaza (2008) note that some of the ICT adoption challenges in developing countries include legal and regulatory issues, weak ICT strategies, lack of research and development, excessive reliance on foreign technology and on-going weaknesses in ICT implementation. Houghton and Winklhofer (2004) have also reported a slow response by SMEs with regard to ICT adoption.

Top management attitudes play a vital role towards the adoption of ICT in organisations and this is regarded as a factor that affects the adoption of ICT in SMEs in developing countries. The top management of any organisation is responsible for determining the appropriate culture, vision and policy of the organisation (Singh, 2008). In SMEs, managers play an important role in decision making and in most cases they are usually the owners of the business. According to Grover (1993), Premkumar and Ramamurthy (1995), Crook and Kumar (1998) and Tarafdar and Vaidya (2006), a proactive approach and active championship on the part of top managers can lead to the successful adoption of ICT. Yap et al. (1992) advocate that management involvement is crucial to the success of ICT in SMEs. Sarkar (2008) argues that support from top management or the owner/manager is a precondition for successful ICT adoption in SMEs. Matlay and Addis (2003) also comment that the decision to adopt ICT by SMEs is likely to be made by the owner. Similarly, Thong (1999) argues that support from the Chief Executive Officer (CEO) would positively influence the likelihood of technology adoption. MacGregor (2004) as well as Xu and Quaddus (2004) indicate that the CEO's educational level is significantly associated with the decision for technology adoption.

Thus, it can be said that the characteristics of the owner-manager can help create a positive organisational attitude towards the adoption of ICT in SMEs. According to Tarafdar and Vaidya (2006), leaders can influence the extent of ICT adoption by clearly defining the role of the new technology. Payton (2000) ascertains that top management often provides the forward motion for the initiation of technology projects. Top management plays an important role in guiding and completing projects relating to ICT adoption, by providing resources for the purchase of the infrastructures required for the new ICT. This implies that a leader's ability in providing resources for ICT initiatives would positively affect an organisation's inclination to adopt ICT.

Therefore, top management cannot only help by sponsoring projects but can also ensure that the necessary technical and human resources are available and can assist in eliminating unnecessary bureaucratic procedures (Kempis and Ringbeck, 1998; Tarafdar and Vaidya, 2006).

According to Culkin and Smith (2000) and Matlay (2000) it is the responsibility of the small business owner/manager to recognise opportunities and threats within their chosen target market. In order to enhance net profit and revenue as well as reduce cost, owners/managers must convey their priorities and expectations to their employees (Singh, 2008). O'Regan et al. (2005) have also observed that leading firms tend to have higher levels of employment with greater involvement by top management in key issues such as staff advancement and disciplinary matters. In other words, the success of small firms is generally attributed to managerial skills, training, education, and personal background of the company's leader. Owner/managers must develop a system that motivates workers to think and act flexibly and productively to meet the company's goals (Singh, 2008). Furthermore, Harindranath et al. (2008a) highlight that small businesses are likely to have a heavy reliance on the expertise and motivations of an owner/manager, particularly in their technical expertise and attitude towards ICT, as this can affect the company's ability and willingness to engage with ICT matters.

Iacovou et al. (1995) confirm that an owner's lack of awareness of the technology and its perceived benefits is a major barrier to the take-up of ICT. Similarly, Julien and Raymond (1994) agree that the owner's level of assertiveness in decision making would affect the adoption of ICT. However, in most cases, Akkeren and Cavaye (1999) state that SME owners are only concerned with a return on investments, hence they are reluctant to make substantial investments when short-term returns are not guaranteed.

Moreover, it is the skill and enthusiasm of the owner/manager that typically drives the business forward and shapes the character of investment decisions (Kapurubandara and Lawson, 2006; Dyerson et al., 2009). According to Dyerson et al. (2009), most SMEs lag behind large firms in their use of ICT both operationally and strategically. Caldeira and Ward (2002) state that the average SME is characterised by a lack of managerial skills to conceive, plan and implement ICT, and tends not to update technology too readily. Pool et al. (2006) and Dyerson et al. (2009) indicate that large firms are usually fast to adopt ICT

whereas the pace of adoption amongst SMEs is much slower. Therefore, it is apparent that owners/managers are responsible for creating, shaping and developing the business of an SME and also play a key role in the adoption and implementation of ICT in SMEs. Sarkar (2009) confirms this by saying that the characteristics of top managers are crucial in determining the innovative attitude of small businesses.

Lack of finance is also a factor which affects the adoption of ICT within SMEs in developing countries. Finance is viewed as a critical element for the development of SMEs (Cook and Nixson, 2000). Dyerson et al. (2009) advocate that SMEs generally struggle with limited resources in terms of time, money and expertise. Levy (1993) emphasises that the limited access to financial resources available to smaller enterprises, as compared to larger organisations, and the consequences for SMEs' growth development are factors that affect ICT adoption in SMEs. According to Wymer and Regan (2005), SMEs generally struggle with scarce resources in terms of time, money and expertise. SMEs also have to cope with competing demands and are often cash poor. Arendt (2008) identifies factors such as the cost of ICT equipment and networks, software, and re-organisation as barriers to ICT adoption in most SMEs.

In many SMEs, capital resource as well as intangible assets such as knowledge, expertise and time, are scarce. SME managers spend a great deal of their time trying to stretch a firm's limited resources as far as possible. Pool et al. (2006) state that allocating scarce resources to a new initiative such as ICT adoption requires a serious commitment. Therefore, Priem and Butler (2001) suggest the need for SMEs to have a combination of resources and capabilities in order to have some sort of competitive advantage. An SME can set itself apart from its competitors if it decides to invest in ICT as this will bring about a sustainable competitive advantage. According to Andrade and Urquhart (2009), SMEs that are prepared to integrate ICT applications must overcome both resource and economy of scale challenges.

The lack of knowledge/awareness about how to use the technology, low computer literacy and poor management processes (e.g. Kirby and Turner, 1993; Costello et al., 2007) are other factors which affect SMEs' adoption of ICT in developing countries. Chibelushi and Costello (2009) argue that lack of awareness may result in SMEs not understanding the potentials which technologies can provide in the areas of efficiency enhancement and

productivity. Awareness has a positive influence on an organisation's inclination to adopt ICT (Tarafdar and Vaidya, 2006). Koh and Maguire (2004) and Taylor and Murphy (2004) explain that most SMEs are generally unaware of the potential of ICT to enhance their business operations. In most cases, SMEs do not have professionally qualified and economic business advisory services that can guide them in relation to changing technology, management processes and practices (Nguyen et al., 2008). The most significant impediment to SMEs exploiting the growing opportunities in a knowledge-based economy is their failure to cope with changes in the business environment (Wickramasinghe and Sharma, 2005). According to Monk (2000), as economies become more connected to the digital marketplace, SMEs' awareness of management processes and tools are necessary to create competitive advantage. Consequently, owner/managers' exposure to ICT technology through interactions with vendors and professional associations increases their awareness and understanding.

Furthermore, the lack of proper guidance is a factor that affects the adoption of ICT amongst SMEs in developing countries. SMEs require proper guidance in making the right choice of technology suitable for their needs (Sharma et al., 2005). Jordan (2002) observed that many SMEs do not have the ability, time or energy to move on to new technology, either due to lack of expertise at their own level or absence of proper guidance, advice and support from stakeholders. According to Jordan (2002), SMEs do not only lack information on the availability and sources of new technology, they also lack a resource base for searching for appropriate partners.

In addition, the organisational cultures of many SMEs in developing countries hinder them from adopting ICT. Punnett and Ricks (1990) define societal/organisational culture as a shared set of values which is typical of the people within the society/organisation and this has a bearing on how technologies are adopted. Tarafdar and Vaidya (2006) comment that the challenge for managers is to cultivate an organisational culture that supports innovation. According to them, studies suggest that the core values of a firm can influence the firm towards choosing a particular strategic alternative or technology. Singh (2008) states that culture and cultural fit are more important in SMEs than other organisations. This is because SMEs have the likelihood of being entirely enveloped in one culture whereas in large organisations several cultures may be present. Ghobadian and Gallear (1996) argue that it is easier to attain cultural change in SMEs than in large organisations.

However, it is probably more difficult for SMEs' management to recognise the need for change. Besides, most SMEs do not have cultures that support the discussion of new and innovative ideas that are related to ICT. Discussions on new and innovative ideas within SMEs have a positive influence on managers in terms of developing and adopting applications of new technology (Apulu and Latham, 2009c). Hoffman and Klepper (2000) state that a culture in which ideas and innovations with respect to ICT are freely shared can potentially help to strengthen the organisational inclination towards new ICT adoption. Furthermore, Mehrtens et al. (2001) state that a favourable organisational attitude towards systems innovation increases the adoption of ICT technologies. In addition, Olutimayin (2002) says that technology is itself part of culture. The existence of a technological change presupposes cultural acceptance. Therefore if a certain technology is not adopted in a society, that technology would not form part of the society's culture and can greatly affect the culture of that society (Olutimayin, 2002). Societal culture is therefore an important organisational determinant for ICT adoption.

3.5.2 Factors affecting ICT Adoption in Nigerian SMEs

Despite the number of factors identified as factors affecting ICT adoption in SMEs, the study now highlights specific factors that affect SMEs in Nigeria. The use of ICT within SMEs in developing countries, unlike developed countries, is plagued with many problems (Lal and Peedoly, 2006) and Nigeria is no exception. In spite of the high diffusion growth rate of digital technologies in recent years, the penetration rate in Nigeria remains low. Ihua (2009) identifies the enormous potentials and immense contribution of the SME sector to sustainable economic development in Nigeria yet concludes that Nigerian SMEs fall below expectation. He further states that several factors affect SMEs' performance in Nigeria and contribute to the increased rate of SMEs failure. This infers that Nigerian SMEs face a significant number of challenges in trying to adopt ICT.

Adenikinju (2005), Akpan-Obong (2007), Lal (2007) and Apulu et al. (2011) amongst others, have identified one or more factors that affect the adoption of ICT in various sectors in Nigeria, including SMEs. These factors include: lack of infrastructural facilities, lack of funds, cost of implementation, lack of awareness, lack of appropriate government policies, lack of skills and training, cultural factors, electricity constraints, corruption, low levels of education, illiteracy, lack of proper information, and so on. Adenikinju (2005) advocates that problems relating to the SME sector in Nigeria and its development have

been handled inappropriately by the government and highlight problems such as infrastructural and cultural factors, as acting against the effective development and exploitation of ICT in Nigeria.

With regard to cultural barriers, many SMEs in Nigeria fail to nurture openness and knowledge sharing hence cannot provide the appropriate human inputs required for their ICT initiatives (Apulu and Latham, 2009a). Also, Malik and Malik (2008) state that a lack of supportive organisational culture and structure may hamper technology initiatives in any organisation. Eruban and de Jong (2006) argue that culture can influence actual behaviour through its influence on attitudes and subjective norms. Hofstede (1984, 2001) has shown that differences in values and attitudes influence the manner in which people interact and make use of their environment. Therefore, it can be said that an open organisational culture within Nigerian SMEs would play a key role towards the adoption and effective utilisation of ICT.

The lack of infrastructural facilities is another factor that affects the adoption and effective utilisation of ICT in Nigerian SMEs. This results from insufficient provision of facilities such as a network backbone and fibre-optic backbone for Wide Area Networks amongst others which are essential for interconnectivity between SMEs (Apulu et al., 2011). Achimugu et al. (2009) indicate that the limited availability of physical infrastructures in Nigeria is a major factor affecting SMEs, development. Chibundu (2006) also stresses that the lack of infrastructure in Nigeria has been a bane of business development. Similarly, Ihua (2009) states that infrastructural inadequacy is as a key constraint to private sector development.

Lal (2007) also considers lack of physical infrastructures in Nigeria as a barrier to ICT adoption. Akpan-Obong (2007) further states that inadequate telecommunication infrastructures pose a major hindrance to the use of ICT in Nigeria. Akpan-Obong (2007) notes that existing telecommunication networks in Nigeria are often limited to urban areas and yet offer poor services when compared with the ultra-high speed systems present in IT-advanced countries. Telecommunication infrastructure is one of the major issues affecting the technology deployment required for growth and development in Nigeria (Jiadaw.com, 2009). Oshikoya and Hussain (2007) claim that many firms in Africa, including Nigeria, operate in an information poor environment due to poor technological infrastructures thus

modernising existing infrastructures as well as building new ones in rural and remote areas is important.

Although recently, telecommunication networks and mobile cellular services are experiencing rapid growth in Nigeria, their penetration especially in rural areas is still very poor (Jidaw.com, 2009). Nonetheless, Nigeria has certainly left behind the telecommunication state where there were only a few dial-up e-mail providers, ISPs, and when the Nigerian Telecommunications Limited (NITEL) was the only telecommunications operator (Jidaw.com, 2009). Furthermore, Mambula and Sawyer (2004) comments that the low level of infrastructure in Nigeria constitutes physical problems to the development of the country's SME sector, and could be attributed to the cut-backs in government finance for basic amenities and public utilities.

Corruption can be placed amongst the main hindrances to the adoption and use of ICT in Nigerian SMEs since corruption is a major factor that affects Nigeria's development. Corruption refers to efforts in securing wealth or power through illegal means for private gain at public expense, or the misuse of public power for private benefit (Obayelu, 2007), and has remained a long-term political and economic challenge in Nigeria. Corruption comprises of illegal payoffs, government officials extorting money from various businesses, the misuse of government funds which could have been used to develop various sectors that are channelled to other directions, and so on. Ayobolu (2006) describes corruption as one of the many unresolved problems that have critically hobbled and skewed Nigeria's development. Dike (2005) stresses that while the issue of corruption is a global phenomenon and not peculiar to Nigeria alone, nevertheless, corruption in Nigeria is widespread. According to Dike (2005), corruption is more or less a way of life for Nigerians and comments that it is acceptable practice to hold out a hand for a bribe in Nigeria. Ochulor and Bassey (2010), stress that Nigeria has been grappling with the problem of corruption in its polity for several years. Moreover, Ojukwu (2006) notes that Nigeria is a country where fraudulent activities such as the Advance Fee Fraud have built a generation of techno-sceptical entrepreneurs. Corruption negatively affects government policies in Nigeria hence proper measures should be taken to end this practice which has eatten deep into the Nigerian system.

Furthermore, Olatokun (2006) highlights that the low level of education amongst a percentage of Nigerians could affect the adoption of ICT. Olatokun (2006) states that Nigeria, as Africa's most populous country, possesses its most valuable resources in human capital, and there are a million people that could be potential candidates for IT training. But, Olatokun (2006) notes that the low levels of education as well as illiteracy amongst the population have continued to affect Nigeria's development. This can cause scarcity of skills within enterprises at all levels from policy making down to end-users and can as well, affect Nigerian SMEs from adopting or effectively utilising ICT. In Nigeria's educational institutions of learning, computers are rarely used for teaching purposes (Apulu et al., 2011), hence there is late introduction to the use of computers and internet services. Also, Kapurubandara (2009) notes that while literacy amongst SMEs is usually high and often SMEs do not have access to professional advice that would assist in solving complex ICT issues.

Similarly, the lack of skills and training can be described as factors which affect the adoption of ICT in Nigerian SMEs. The skill deficiencies appearing in SMEs include not only technical abilities but also management skills (Arendt, 2008). Many SMEs in Nigeria do not develop training plans that can help employees to acquire the skills necessary for their business. Besides, the lack of technological backgrounds in SMEs have usually hindered them in adopting ICT. In Nigeria, owners/managers are usually reluctant to invest in the training of employees because they are afraid that following the completion of such training and having improved their qualifications, the employees will leave and find employment in large companies that offer better salaries (Apulu and Latham, 2009a). The majority of SME owners/managers in Nigeria are sceptical of investing in ICT due to the cost implications associated with training employees as well as the cost implications for maintaining their ICT equipment.

The cost associated with the implementation of ICT within SMEs has been identified by Folorunsho et al. (2006) as a possible factor inhibiting many Nigerian SMEs from adopting ICT. They define the cost of implementation as the total amount that it is required for business organisations to implement a new technology. According to them, many SMEs in Nigeria stress that the cost of implementing ICT is very high and that the money can be used for other purposes that will be more effective and profitable when compared to the benefits that could be derived from the implementation of ICT. These authors state that

SMEs' owners/managers try to determine the investment rate of return for adopting ICT as such investments are carried out over relatively long periods. Similarly, Arikpo et al. (2009) in their study argue that the high subscription and infrastructure costs, coupled with the poor quality of service by service providers at inception, act as a major hindrance to the use of ICT in educational research and development in Nigeria. Abor and Quartey (2010) confirm that a unique problem often experienced by SMEs is the lack of capital. Nigerian SMEs' development is inevitably constrained by the limited availability of financial resources to meet a variety of operational and investment needs. Many SMEs in Nigeria struggle with the high cost involved in implementing ICT, hence they sometimes ignore the adoption or effective utilisation of ICT applications (Apulu et al., 2011). Rather, they use their resources for other purposes that will bring about fast profits (Folorunsho et al., 2006).

The lack of funds amongst SMEs due to the lack of support from banks has been identified by Owoseye (2010) as a major factor that affects the development of Nigerian SMEs which can also, prevent them from adopting ICT. Owoseye (2010) found that the major complaints made by SME operators are lack of funds and an unfavourable business environment. The author notes that banks are mandated to give out loans to small businesses especially the Agricultural Development Banks (ADBs) but the inability of most small business owners and intending entrepreneurs to present the required collateral remains a major setback. A large percentage of the SME sector in Nigeria often does not have access to adequate and appropriate forms of credit (Apulu et al., 2011). Elumilade et al. (2006) note that it is common practice in Nigeria for SMEs owners to organise themselves into cooperatives, commonly called "Esusu". Members of an Esusu group would generally contribute a fixed amount daily, weekly or monthly and then collect in turn, just to fund their businesses or personal projects.

Furthermore, the electricity constraint in Nigeria is described as a factor that affects the adoption of ICT amongst Nigerian institutions (Agyeman, 2007) including SMEs. Tallapragada (2009) acknowledges that Nigeria has tremendous energy resources in the form of abundant gas, water and mineral resources, yet it is highly energy deficient. Baker (2008) states that Nigeria is the largest oil producer in Africa and also holds approximately one third of the proven gas reserves in Africa, but a lack of power supply has remained a major problem in the country. According to Baker (2008), 60% of Nigeria's population

lack access to electricity for their basic needs with only 20% of rural households covered, and less than 20% of the Nigerian population have access to a stable electricity supply. Akpan-Obong (2007) confirms that many rural areas in Nigeria have no electricity supply while in the towns and cities where there is electricity, its supply is limited. The lack of electricity generation and distribution in Nigeria has negatively affected the diffusion levels of ICT in the country (Akpan-Obong, 2007).

Likewise, Olatokun (2006) describes the irregular electricity supplies in Nigeria as a common feature that can act as a major barrier to the use of ICT, especially outside the major towns. Nigeria has extremely limited power distribution networks which do not penetrate significantly into rural areas. Power shedding is a common occurrence even in major cities. According to Agyeman (2007), Nigeria generates 3,500 megawatts of electricity against a required minimum of 5,500 megawatts. About 40% of Nigerians enjoy electricity from the national grid; however, the electric power supply is sporadic and several communities in urban areas lack electric power. Agyeman (2007) further states that 57 of the 774 local government headquarters are yet to be connected to the grid and that rural communities are worse off due to the absence of infrastructure. The majority of SMEs in Nigeria are badly affected by constant power failure and in most cases they decide to purchase power-generating equipment (generator) which requires large sums of money. Such investment is usually exorbitant for SMEs and constitutes a heavy burden on their finances (Agyeman, 2007).

Again, the lack of adequate support from the government in terms of initiatives and also the lack of policies/institutional framework that support SMEs, inhibit them from adopting or effectively utilising ICT in Nigeria. For example, an IT policy was formulated by NITDA in 2001 but has not been properly implemented (Apulu and Latham, 2009; Baro, 2011). Oyesanya (2005) states that NITDA has failed in its attempt to implement the 2001 information technology policy because it lacks the necessary legislative regulatory framework. According to Apulu and Ige (2011), government policies and initiatives which are meant to act as motivators are not in full support of SMEs in Nigeria. Oyesanya (2005) states that there is a need for the restructuring of NITDA into an independent organisation that would be capable of enhancing ICT growth and diffusion. Consequently, Adeyeye and Iweha (2005) declare that verbal commitment to the national information technology policy does not guarantee a political will for its implementation. Adeyeye and Iweha

(2005) expressed concern over the delayed passing of the information technology bill into law and conclude that if passed, it would give legal backing to the establishment of NITDA and provide for its sustenance.

According to Ling (2001), Rashid and Qirim (2001) and Tan and Teo (2000), government policies are supposed to increase competitiveness in the marketplace to ensure SMEs have greater influence on the use of ICT. Therefore the Nigerian government is expected to be a regulator of economic activities that are related to SMEs, for example, the banks and SMEs in Nigeria. Alam and Noor (2009) also note that industries and government bodies have a role to play in promoting and supporting small business networks and ICT. With the globalisation of the ICT industry, there is a need to understand the government's role in contributing to the success of ICT development within Nigerian SMEs. The following tables (i.e. Tables 3.1, 3.2, 3.3, 3.4, 3.5, and 3.6) present a summary of key factors identified affecting SMEs in general, SMEs in developing countries including Nigeria, factors affecting ICT adoption in SMEs, factors affecting SMEs in developing countries, as well as factors specifically affecting the adoption of ICT in Nigerian SMEs.

Table 3.1: SMEs challenges in general

Challenges in SMEs	**Related Literature**	**Nature of Research Studies**
Lack of finance	Levy (1993); Cook and Nixson (2000); Lawrence (2009); Abor and Quartey (2010)	Levy (1993) – Survey and open-ended interviews with 24 SMEs Cook and Nixson (2000) – Literature review Lawrence (2009) – Literature review Abor and Quartey (2010) - Literature review
Lack of managerial skill	Kayanula and Quartey (2000); Abor and Quartey (2010)	Kayanula and Quartey (2000) – Literature review. Abor and Quartey (2010) - Literature review
Lack of equipment and technology	Abor and Quartey (2010)	Abor and Quartey (2010) - Literature review
Regulatory issues	Abor and Quartey (2010)	Abor and Quartey (2010) - Literature review
Lack of access to international markets	Abor and Quartey (2010)	Abor and Quartey (2010) - Literature review
Lack of support services	Abor and Quartey (2010)	Abor and Quartey (2010) - Literature review

Lack of information resources	Auger and Gallaugher (1997)	Auger and Gallaugher (1997) – Survey of 141 SMEs
Lack of planning, high cost of training and advisory services	Lawrence (2009); Kayanula and Quartey (2000)	Lawrence (2009) – Literature review Kayanula and Quartey (2000) – Literature review
Lack of appropriate forms of credit	Abor and Quartey (2010)	Abor and Quartey (2010) - Literature review

Table 3.2: SMEs constraints in Nigeria

Constraints	**Related Literature**	**Nature of Research Studies**
Inadequate and inefficient infrastructural facilities	Olorunshola (2003)	Olorunshola (2003) – Literature review
Cost of operation	Olorunshola (2003)	Olorunshola (2003) – Literature review
Insufficient capital/ Lack of support from banks	Onuorah (2009); Olorunshola (2003); Ayanda and Laraba (2011)	Onuorah (2009) – Survey of 200 SMEs Olorunshola (2003) – Literature review Ayanda and Laraba (2011) – Literature review
Lack of focus and inadequate market research; lack of proper book keeping; inability to separate business and family finances; lack of business strategy; inability to utilise/access modern technology; inability to distinguish between revenue and profit; lack of succession plan; inability to employ the right calibre of staff	Onugu (2005)	Onugu (2005) – Survey, personal interviews, library and desk research
Multiplicity of taxes and levies	Ihua (2009)	Ihua (2009) – Survey of 45 SMEs in the United Kingdom and Nigeria respectively and semi-structured interviews with 4 SMEs (2 in the UK and 2 in Nigeria)
Poor management practices; low entrepreneurial skills; lack of educational and technical background	Olorunshola (2003)	Olorunshola (2003) – Literature review
Non-adoption of technology; unfavourable fiscal	Onuorah (2009)	Onuorah (2009) – Survey of 200 SMEs

policy/policies inconsistencies/poor policy implementation; uneasy access to funding; lack of requisite skills and experience		

Table 3.3: Factors affecting ICT adoption in developing countries

Factor	**Related Literature**	**Nature of Research Studies**
Lack of skilled personnel	Kunda and Brooks (2000)	Kunda and Brooks (2000) – Survey questionnaires were distributed to 120 potential respondents and 14 usable responses (12%) were received
Lack of telecommunications infrastructure; poor internet connectivity; under developed state of ISPs	Weiner and Rumainy (2007); Kapurubandara and Lawson (2006)	Weiner and Rumainy (2007) – Literature review Kapurubandara and Lawson (2006) - Preliminary pilot interviews with 17 SMEs, questionnaire of 625 SMEs and 6 interviews with intermediary organisations
Lack of resources	Weiner and Rumainy (2007)	Weiner and Rumainy (2007) – Literature review

Table 3.4: Factors affecting ICT adoption in SMEs

Factors	Related Literature	Nature of Research Studies
Limited financial resources	Ashrafi and Murtaza (2008)	Ashrafi and Murtaza (2008) – Survey of 51 SMEs
Lack of ICT skills and knowledge	Duan et al. (2002)	Duan et al. (2002) - Questionnaires were distributed to SMEs in the UK manufacturing sector with 87 responses (9.2% response rate) of which 81 were usable - Translated questionnaire were distributed to 200 businesses in Poland. A total of 30 usable questionnaires were completed (15% response rate)

		- Questionnaires were sent by mail to 552 SMEs in Portugal. A total of 69 usable responses were collected (12.5% response rate)
Lack of technical and managerial capacity	Ongori (2009)	Ongori (2009) – Survey

Table 3.5: Factors affecting ICT adoption in SMEs in developing countries

Factors	**Related Literature**	**Nature of Research Studies**
Owner/Managers characteristics; role of top management	Kapurubandara and Lawson (2006); Caldeira and Ward (2002)	Kapurubandara and Lawson (2006) - Preliminary pilot interviews with 17 SMEs, questionnaire of 625 SMEs and 6 interviews with intermediary organisations Caldeira and Ward (2002) – In-depth case studies of 12 firms
Lack of adequate telecommunications infrastructure	Kapurubandara and Lawson (2006); Kunda and Brooks (2000); Lal (2007)	Kapurubandara and Lawson (2006) - Preliminary pilot interviews with 17 SMEs, questionnaire of 625 SMEs and 6 interviews with intermediary organisations Kunda and Brooks (2000) – Survey questionnaires were distributed to 120 potential respondents and 14 usable responses (12%) were received Lal (2007) – Survey of 67 SMEs
Legal and regulatory issues	Ashrafi and Murtaza (2008)	Ashrafi and Murtaza (2008) – Survey of 51 SMEs
Lack of awareness amongst owners/managers	Iacovou et al. (1995)	Iacovou et al. (1995) – Case study of 7 firms
Lack of finance; scarce resources	Cook and Nixson (2000); Dyerson et al (2009); Levy (1993); Wymer and Regan (2005)	Cook and Nixson (2000) - Literature review Dyerson et al. (2009) – Survey Levy (1993) - Survey and open-ended interviews with 24 SMEs Wymer and Regan (2005) –

		Survey
Lack of knowledge; Lack of awareness; Low computer literacy; Poor management process	Kirby and Turner (1993); Chibelushi and Costello (2009); Tarafdar and Vaidya (2006)	Kirby and Turner (1993) – Survey of 148 customers Chibelushi and Costello (2009) – 73 interviews with company managers in West Midlands Tarafdar and Vaidya (2006) – Case study of 4 firms in the financial service industry in India
Failure to cope with changes	Wickramasinghe and Sharma (2005)	Wickramasinghe and Sharma (2005) – Literature review
Lack of proper guidance	Sharma et al. (2005)	Sharma et al. (2005) – Survey of 147 SMEs
Organisational culture	Tarafdar and Vaidya (2006); Apulu and Latham (2009c)	Tarafdar and Vaidya (2006) – Case study of 4 firms in the financial service industry in India Apulu and Latham (2009c) – Literature review

Table 3.6: Factors affecting ICT adoption in Nigeria including SMEs

Factors	**Related Literature**	**Nature of Research Studies**
Cultural barrier	Adenikinju (2005)	Adenikinju (2005) – Survey of 300 manufacturing enterprises
Lack of infrastructural facilities	Adenikinju (2005); Apulu et al. (2011); Achimugu et al (2009); Chibundu (2006); Ihua (2009); Lal (2007); Mambula (2004)	Adenikinju (2005) – Survey of 300 manufacturing enterprises Apulu et al. (2011) – Case studies of 25 SMEs Achimugu et al (2009) – Literature review Chibundu (2006) – Literature review Ihua (2009) - Survey of 45 SMEs in the United Kingdom and Nigeria respectively and Semi-structured interviews of 4 firms (2 in the UK and 2 in Nigeria) Lal (2007) - Survey of 67 SMEs Mambula (2004) – Case studies
Lack of telecommunication infrastructure	Akpan-Obong (2007); Oshikoya and Hussain (2007)	Akpan-Obong (2007) – Literature review

		Oshikoya and Hussain (2007) - Literature review
Corruption	Obayelu (2007); Ayobolu (2006); Dike (2005); Ochulor and Bassey (2010); Ojukwu (2006)	Obayelu (2007) – Literature review Ayobolu (2006) – Literature review Dike (2005) – Literature review Ochulor and Bassey (2010) - Literature review Ojukwu (2006) – Structured interviews
Low level of education	Olatokun (2006); Apulu et al. (2011)	Olatokun (2006) – Literature review Apulu et al. (2011) - Case studies of 25 SMEs
Lack of skills and training; technological background	Mambula (2004); Apulu and Latham (2009c)	Mambula (2004) – Case studies Apulu and Latham (2009c) – Literature review
Cost of implementation	Folorunsho et al. (2006)	Folorunsho et al. (2006) – Survey
Lack of capital	Abor and Quartey (2010)	Abor and Quartey (2010) – Literature review
Lack of support from banks	Apulu et al. (2011)	Apulu et al. (2011) - Case studies of 25 SMEs
Electricity constraint	Agyeman (2007); Akpan-Obong (2007); Olatokun (2006)	Agyeman (2007) – Literature review Akpan-Obong (2007) – Literature review Olatokun (2006) – Literature review
Lack of support from the government; Lack of regulatory policies; institutional framework	Apulu and Ige (2011); Apulu et al. (2011); Baro (2011); Adeyeye and Iweha (2005)	Apulu and Ige (2011) – Survey of 250 questionnaires were distributed and 180 copies were returned. Apulu et al. (2011) - Case studies of 25 SMEs Baro (2011) – Literature review Adeyeye and Iweha (2005) – Literature review

Insights from the review of the literature suggest that SMEs play a significant role in the economic development of every country and Nigeria is no exception. The literature review also confirms that a large percentage of organisations in developed and developing countries are SMEs or belong to the SME sector. Likewise, it has been noted that ICT is a driver of change in many organisations. The benefits of ICT cut across all sectors and its role in SMEs is crucial. Thus the adoption and effective utilisation of ICT should be considered by SMEs in Nigeria since ICT can help in the advancement of their businesses. Moreover, SMEs are known to be the driving force behind Nigeria's economic development. ICT is regarded as a competitive tool for every organisation in this present era of globalisation, therefore Nigerian SMEs should adopt and effectively utilise it. But, the literature review indicates that SMEs in developing countries, particularly in SSA, are quite slow in participating in ICT advancements as compared to their counterparts in other regions. Factors such as the lack of electricity, poor internet connectivity, lack of resources amongst many others has been highlighted as possible factors affecting the adoption and proper utilisation of ICT applications by SMEs, including Nigerian SMEs, which is the focus of this research.

Hence, there is a need to identify/reassess factors inhibiting Nigerian SMEs from adopting/effectively utilising ICT. There is also a need to introduce a guide or proffer specific recommendations on how the various factors inhibiting Nigerian SMEs from taking up ICT can be resolved. The literature review suggests that the rate of ICT penetration in Nigerian SMEs has remained low, despite the high rate of ICT penetration globally in recent years. With the level of globalisation in recent years and SMEs being a key contributor to Nigeria's economic development, their adoption and effective utilisation of ICT would assist them to amply compete with their counterparts in other regions which will in turn, help to increase the country's economic growth. Based on the insights from the literature and key issues that have been identified, the main question for this research is: ***How can the factors affecting the adoption and effective utilisation of ICT in Nigerian SMEs be resolved?***

3.6 Summary

This chapter has presented a review of the literature in relation to ICT adoption and SMEs thereby defining the scope of the research. ICT is said to be an integral part of the development process of any country and is indispensable to the operation of core routines

in SMEs. This chapter has also described the characteristics of SMEs, which differentiate them from large organisations, and has discussed the role of SMEs in the economic development of every country including that of Nigeria. The adoption of ICT is said to be vital for SMEs' survival since it provides them with the opportunity to compete with larger organisations and operate on an international scale. This chapter has also identified some benefits of ICT adoption in SMEs which confirms that the effective use of ICT can assist SMEs to experience some strategic advantages. ICT is said to be influenced by a number of characteristics such as the role of the owner/manager, the level of government commitment and so on. The identification of relevant literature on SMEs and ICT as well as factors that affect the adoption of ICT forms the basis of the research. The literature review shows that there exists a digital divide between developed and developing countries especially in SSA and concludes that SMEs in Nigeria still lag behind in the adoption and use of ICT in the current knowledge based economy.

CHAPTER FOUR - RESEARCH METHODOLOGY

4.0 Introduction

This chapter discusses the procedure by which the research was conducted with a justification for the chosen approach. It addresses the research methods adopted for capturing the data required to achieve the research aim. The qualitative research method was used in this study to identify strategies that would assist in increasing the adoption and effective utilisation of Information and Communication Technology (ICT) in Nigeria's Small and Medium Sized Enterprises (SMEs). Based on the discussions in the previous chapters, the interpretivist philosophical paradigm within a qualitative methodology was selected as the most appropriate for this study. Klein and Myers (1999) noted that interpretive research can help Information Systems (IS) researchers to understand human thought and action in social and organisational contexts. Furthermore, the research is exploratory and descriptive in nature and will assist in understanding emerging issues that are related to the subject.

4.1 Styles of Research

Saunders et al. (2003) describe research as "something that people undertake in order to find out things in a systematic way thereby increasing their knowledge". They further identified the characteristics of a good research which include: ensuring data are collected systematically, data are interpreted systematically and there is a clear purpose to find things out. There are different styles of research such as constructive, theoretical, empirical, nomothetic, idiographic, critical, information systems research and so on.

Information systems research for example, is concerned with the development and use of information systems by individuals, organisations and society (Oates, 2006), and is usually based on ICT (Orlikowski and Iacono, 2001; Weber, 2003). It best describes the research style for this study as this research is concerned with the adoption and effective utilisation of ICT in organisations, SMEs in particular. Cornford and Smithson (1996) note that the overall research endeavour in information systems, just like any other discipline, involves many different styles and types of work. A general description of the other styles of research is contained in H-1 in appendix H.

4.2 Research Method, Research Methodology, Research Strategy, Philosophical Paradigm

A method is a systematic and orderly **approach** taken towards the collection and analysis of data so that information can be obtained from those data (Jankowicz, 2005). **Methods** are defined as the techniques or procedures used to gather and analyse data related to some research questions or hypotheses (Crotty, 1998). **Methodology** is defined as a strategy, plan of action, process or design lying behind the choice and use of particular methods and linking the choice and use of those methods to the desired outcomes (Crotty, 1998). Grix (2002) defines **methodology** as the discussion of how a piece of research should be undertaken. Leedy (1997) states that research methodology should address four main issues: what data are needed, where the data are located, how data are obtained and how data are analysed.

A **research strategy** is also known as a **research plan or design.** Research strategy is an **overall approach** that a researcher adopts in order to answer the research question (Saunders et al., 2003). A research strategy or plan of action is the design that shapes a researcher's choice and use of particular methods and links them to the desired outcomes (Crotty, 1998). A **Philosophical paradigm** is sometimes referred to as a **research paradigm** and is known as the philosophy of a particular research. The research paradigm/philosophy offers a framework, consisting of theories, methods and ways of defining data which explains the relationship between data and theory (Collis and Hussey, 2003; Easterby-Smith et al. 1991).

One of the most challenging issues about understanding research design is the fact that scholars use various terms to describe research approaches and strategies. However, this research adopts Saunders et al.'s (2009) description of the different research terms as shown in figure 4.1.

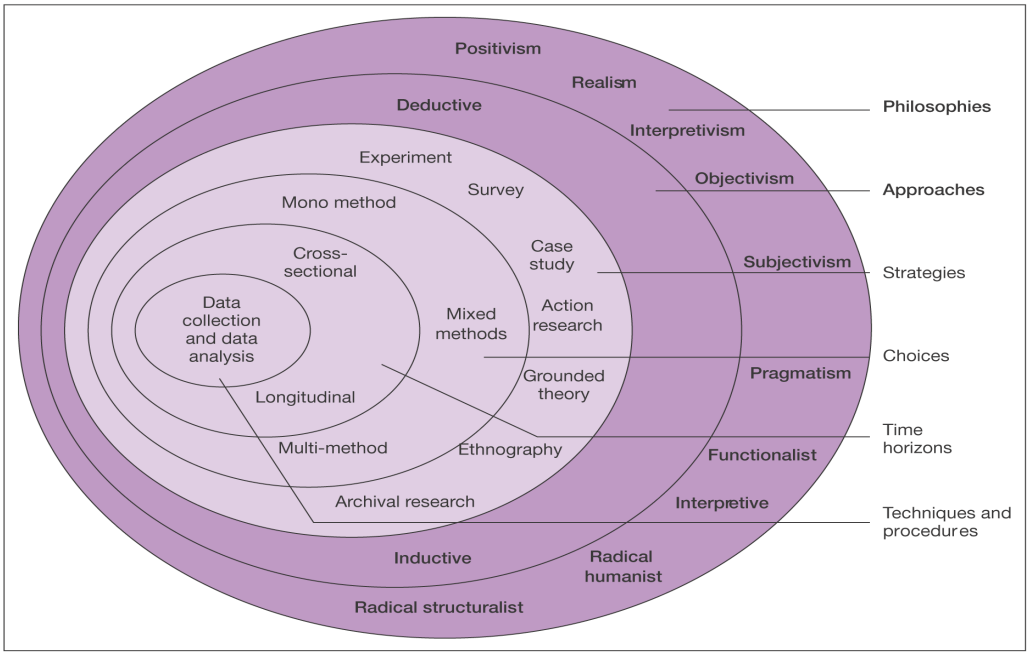

Fig. 4.1: The research "onion" (Adapted from Saunders et al., 2007).

4.2.1 Philosophical Paradigm

Saunders et al. (2003) define philosophy as the belief and thinking that an individual has about knowledge and how it is created and developed. Saunders et al. (2009) explain that research philosophy is influenced by the manner in which a researcher reasons about the development of knowledge and will affect the way the researcher conducts the research itself. Oates (2006) defines a paradigm as a set of shared assumptions or ways of thinking about some aspect of the world. Philosophical paradigm is also regarded as the epistemology which guides a research (Myers, 2009).

Easterby-Smith et al. (1991) give three reasons that underline the need to understand philosophical paradigms in a research study. Firstly, it helps to define the research design, the type of evidence that is required, how it will be gathered and interpreted, and how this will provide answers to the research questions. Secondly, it helps the researcher to identify which research design will work for a particular study. Thirdly, it can help the researcher to create designs that may not be related to the researcher's experience.

A wide range of research strategies with different philosophical paradigms are used in information systems. For example, Basden (2008) has provided an intensive literature review on philosophy, particularly as it relates to information systems. According to Holden and Lynch (2004), two central concepts of philosophy have to be considered to

match the research approach and underlying philosophy; these are **ontology** and **epistemology**.

4.2.1.1 Ontology

Ontology is concerned with the nature of reality (Saunders et al., 2009). It is the science or study of being and is often used synonymously with metaphysics, one of the oldest branches of philosophy (Holden and Lynch, 2004). Crotty (2003) defines ontology as what is known or what constitutes social reality. Grix (2002) describes ontology as the starting point of all research, after which one's epistemological and methodological positions logically follow. There are two aspects of ontology, **objectivism** (also referred to as critical view, evaluatism, empiricism, logical positivism, and dualism) and **constructivism** (also referred to as subjectivism, interpretivism, absolutism, relativism, postpositivism, and constructionism) (Huglin, 2003).

In objectivism**,** knowledge is out there waiting to be discovered and it is used mainly by scientists. Therefore, scientific observation and experimentation are used to generate new knowledge. Collis and Hussey (2003) also highlight that positivism focuses on using natural science methods for gathering knowledge. The authors state that a positivist approach believes that "the study of human behaviour should be conducted in the same way as studies conducted in natural sciences". According to Myers (2009), positivism or objectivism, is often referred to as the natural science model of social research, whilst constructivism is of the opinion that knowledge is socially constructed by our interaction with our environment. Constructivism is mainly used by social scientists to study human behaviour, thus it is also referred to as **social constructivism** (Saunders et al., 2009). The main difference between the two positions is usually based on how a researcher believes knowledge is created.

4.2.1.2 Epistemology

Epistemology concerns what constitutes acceptable knowledge in a field of study (Saunders et al., 2009). According to Grix (2002), epistemology is one of the core branches of philosophy that is concerned with the theory of knowledge, especially with regard to its methods, validation and the possible ways of gaining knowledge of social reality, or whatever it is understood to be. Epistemology, derived from the Greek words *episteme* (knowledge) and *logos* (reason), focuses on the knowledge-gathering process and is concerned with developing new models or theories that are better than competing models

and theories (Grix, 2002). Epistemology **(also referred to as postpositivism)** is difficult sometimes to differentiate from ontology as they are both concerned with knowledge. The epistemological assumption can be separated into either positivistic or interpretivist paradigms (Collis and Hussey, 2003). However, Crotty (2003) identifies that in recent times, other stances have emerged such as feminism, critical inquiry and so on. Interpretivism is a paradigm that is growing in acceptance in the field of information systems (Walsham, 2006).

4.2.1.3 Interpretivism

Interpretivism is also referred to as **social constructionism** and is described by Orange (2010) as a research philosophy that views the social world as socially constructed. According to Bryman (2001), interpretivists seek to understand human behaviour and the social world whereas a positivist would seek to explain the situation. Bryman and Bell (2007) describe constructionism as an ontological position that describes social phenomena and their meaning that are constantly being accomplished by social actors and are "socially constructed" giving meaning from people. Easterby-Smith et al. (2008) state that social constructionism focuses on the way people make sense of the world, especially through sharing experiences with others. Bryman and Bell (2007) argue that the principal aim of interpretivism should be to explain why people have different experiences through social interaction and to understand that they are continually changing.

Interpretive research in IS and computing is concerned with understanding the social context of an information system; this means the social processes by which it is developed and constructed by people and through which it influences, and is influenced by, its social setting (Oates, 2006). It is an approach that enables researchers to consider, the social context of systems and how these systems are influenced and can influence the setting (Galliers, 1991; Klein and Myers, 1999; Oates, 2006).

Williamson et al. (2002) further argue that the interpretive approach is often (although not exclusively) associated with qualitative research techniques, whereas the positivist approach is usually (again, not exclusively) aligned with quantitative techniques. Bryman (2008) states that the interpretivist philosophy is based on the belief that a strategy is needed to differentiate between people and objects in the natural sciences; therefore, this philosophy requires the researcher to understand the subjective meaning of social action. According to Saunders et al. (2009) interpretivism advocates that it is necessary for the researcher to understand the differences between humans in our role as social actors. Also,

Taylor and Bogdan (1998) state that interpretivists think it is necessary to capture the process of human interpretation, where qualitative research is a better method. Moreover, Collis and Hussey (2003) indicate that interpretivism requires a qualitative approach, which refers back to `**how**' and `**what**' research questions. In addition, Walsham (1995) states that interpretive research methods in IS are aimed at producing an understanding of both the context of IS and the process. Orlikowski and Baroudi (1991) have identified another philosophical paradigm, i.e. critical research that applies to information systems. Also, Chua (1986) states that there are three approaches to studying IT/ICT in organisations, namely positivist, interpretive and critical research.

4.2.1.4 Critical Research

Critical research, often portrayed as a third alternative to the first set of paradigms (positivism and interpretivism), is a philosophy that accepts social reality as interpretivism does, but claims that social reality has objective properties that can dominate the way we perceive the world (Orlikowski and Baroudi, 1991; Myers, 1997; Oates, 2006). The central issue of critical research is that it aims to change social reality and promote emancipation (Niehaves and Stahl, 2006). According to Myers (2009), critical research is less common, but similar to that of interpretive research.

4.2.2. The Current Research Philosophical Paradigm

The epistemological position taken for this research is that of **interpretivism.** The interpretivist approach is adopted since more explorations are required on the research topic, in order to put forward recommendations that will assist in dealing with the key factors affecting the adoption and effective utilisation of ICT systems/applications within Nigerian SMEs in a particular region. Besides, the research is not guided by theory that has to be tested objectively during the research process, rather it is aimed at identifying and understanding problems confronting Nigerian SMEs, and further providing recommendations on how the problems could be resolved based on empirical data. The research intends to identify strategies that would assist SMEs in Nigeria to successfully adopt and effectively utilise ICT, including sophisticated applications/systems. The problem of how technology is utilised amongst Nigerian SMEs is regarded as a social problem as it pertains to a particular society, therefore cannot be properly investigated by using the positivistic approach.

Moreover, interpretivists usually perform a literature review to develop a thorough understanding of the topic under investigation, then, based on the literature review, they generate research questions and plan to conduct the study (Williamson et al., 2002), which is the process adopted for this research. The research considers the relationship between small businesses and their use of information and communication technologies. According to Creswell (1994), a research problem is linked to a positivist approach if it develops from the literature where variables and theories may exist that need to be tested and verified. Whereas, a research problem is related to an interpretivist approach when little information exists on the topic and more exploration is needed since the variables are largely unknown, as is the case for this study. Also, the view of an interpretivism paradigm would assist the researcher to gain rich insights into the social phenomena of how some Nigerian SMEs perceive the use of ICT and its contributions to the development of their businesses. A table that provides the key implications of positivism and interpretivism/social constructionism is contained in H-2 in appendix H. Having described the main concepts of the philosophical paradigms, the next section describes the different types of research approaches.

4.3 Research Approaches

There are two important schools of thoughts with respect to methodology in the area of theory development and knowledge building. These are **deductive** and **inductive** research methods (Crowther and Lancaster, 2008). The differences between these alternative approaches to research are explained below.

4.3.1 Deductive Research

Deductive research develops theories or hypotheses and then tests them out through empirical observation. It is essentially a set of technique for applying theories in the real world in order to test and assess their validity (Crowther and Lancaster, 2008). According to Saunders et al. (2009), deductive research can be quicker to complete, albeit that time must be devoted to setting up the study prior to data collection and analysis. In deductive research, it is possible to predict the time schedules accurately. Deductive research can be regarded as a lower risk strategy, notwithstanding there are risks involved such as non-return of questionnaires.

4.3.2. Inductive Research

Inductive research essentially reverses the process found in deductive research. In this case the researcher develops hypotheses and theories with a view to explaining empirical observations of the real world. Empirical observations can be based on many factors; for example, they can be based on personal experience (Crowther and Lancaster, 2008). Alternatively, theories might be developed to explain observed data and information; for example, the researcher might develop theories based on observed patterns of labour turnover. All sorts and types of information and data can be used to develop theories in inductive research (Crowther and Lancaster, 2008).

Crowther and Lancaster (2008) further state that one of the greatest strengths of inductive research is its flexibility. Inductive research enables flexibility in research design including aspects such as sample size and type of data and does not require the establishment of *priori* theories or hypotheses. On the other hand, the authors argue that a researcher can build their theory based on what is observed, thereby allowing a problem or issue to be studied or approached in several possible different ways with alternative explanations of what is going on. Crowther and Lancaster (2008) also note that inductive research is suitable for studying human behaviour in organisations.

However, Saunders et al (2009) stress that inductive research can be much more protracted. The authors argue that inductive research takes a longer period for data collection and analysis has to emerge gradually. With inductive research, there is the fear that no useful data patterns or theory will emerge (Saunders et al., 2009). The major differences between the deductive and inductive approaches are described in a table contained in H-3 in appendix H. Ghauri and Grønhaug (2005) note that "the processes of induction and deduction are not totally exclusive of each other and induction includes elements of deduction and vice versa." Quinton and Smallbone (2006) also state that there is not such a sharp divide between the two research approaches.

According to Jankowicz (2005), it is important not to confuse the two distinctions; i.e. positivist versus interpretivist, ontology and epistemology on the one hand and between qualitative versus quantitative data analysis on the other. Jankowicz (2005) states that positivist approaches in the past have given primacy to the quantitative methods while interpretivist approaches do argue for the primacy of qualitative methods and techniques. However, both qualitative and quantitative techniques can be used even when a research is based on a purely interpretivist rationale. The present research is an inductive research

which studies SMEs in a particular context and aims not to generalise the research findings.

4.4 Research Strategy

The research strategy dictates the major direction of the research and constitutes one of the important decisions made by the researcher (Pathirage et al, 2008). Yin (2003) refers to research strategy as research design and defines it as "a logical plan for getting from here to there, where here may be defined as the initial set of questions to be answered, and there is some set of conclusions (answers) about these questions". In addition, Marshall and Rossman (1999) state that a research strategy consists of the overall rationale; site selection, population selection or both; the researcher's role; data collection methods; data management; data analysis strategy; trustworthiness features; and, a management plan. The choice of an appropriate research approach not only reflects the nature of the study but the research objectives as well. There is a wide range of methods for conducting research such as experiments, action research, ethnography, case study, grounded theory and so on; however, Saunders et al. (2007) refer to them as research strategies' as indicated in fig 4.1. Two research strategies (survey and case study) were adopted in this research.

4.4.1 Survey

Survey strategies are most often associated with the positivist paradigm (Oates, 2006) as they seek patterns to try to explain phenomena. Researchers using this method assume that there are patterns that exist; however, surveys cannot confirm cause and effect in the same way as a scientific experiment but do give an opportunity to see if an association exists between variables (Oates, 2006). Avison (1993) states that surveys are useful in obtaining consistent data from a large number of people and patterns are then searched for in the data. Surveys do not always use questionnaires but can use interviews, observation, documents and so on.

There are two major types of survey, i.e descriptive and analytical. A descriptive survey is concerned with identifying and counting the frequency of a specific population, either at one point in time or at various times for comparison, whilst an analytical survey is concerned with identifying relationships between different variables (Collis and Hussey, 2003). Surveys provide opportunities to analyse large amounts of data and to make generalisations (Kelly et al., 2003).

4.4.2. Case study

Case studies offer an in-depth view of procedures as they unfold in organisations (Hartley, 1994). Case study research consists of a detailed investigation for which data are often collected over a period of time within their context (Cassell and Symon, 2004). The aim is to provide an analysis of the context and process (Easton, 1992) which illuminates the theoretical issues being studied. Furthermore, Cassell and Symon (2004) describe a case study as not just a method but a rich strategy. Case studies can be useful for exploring new or emerging processes or behaviours (Cassell and Symon, 2004; Marschan-Piekkari and Welch, 2004; Ghauri and Grønhaug, 2005). They have an important function in generating hypotheses and building theory. Case studies can be used where the intention is to explore not typically but unusualness or extremity with the intention of revealing the process. They can also be useful in capturing the emergent and changing properties of life in organisations (Cassell and Symon, 2004). Case studies are usually applied where the boundaries between the phenomenon under investigation and its context are not clearly evident (Yin, 2003). Yin (2009) further states that the "case study is used in many situations to contribute to our knowledge of individual, group, organisational, social, political and related phenomena." More on case studies and surveys are discussed in subsequent sections. Additionally, descriptions of other research strategies can be found in H-4 in appendix H.

4.5 Research Methods

Data can be collected from several sources using different methodologies. According to Blaxter et al (1996), the data required can be classified as qualitative if it come in word form, while they are regarded as quantitative if they come in the form of numbers. The proper selection of quantitative and qualitative methods and the understanding of their application to the research context are vital to the success of a research in terms of presenting the phenomenon being studied. However, Boaduo (2005) regards the choice of a methodology or multiplicity of methods for a research as a major problem, especially to beginning researchers. Some researchers prefer to use either a single method or a multiplicity (multi-method), usually referred to as triangulation.

4.5.1 Quantitative Method

Quantitative research relies on developing metrics (numbers) that can be used to describe the phenomena (objects and relationships) under study. It involves the application of a numerical approach to the issue under study as well as to the data analysis. Such data can

subsequently be analysed using the techniques of statistical analysis (Cornford and Smithson, 1996). Quantitative methodologies are suitable to measure behaviours and descriptive aspects, allowing comparison and replication. Jayaratne (1993) argues that quantitative research allows large scale data collection and analysis at a reasonable cost and effort and also gives statistical proof. Quantitative research designs are characterised by the assumption that human behaviour can be explained by what may be termed "social facts" which can be investigated by methodologies that utilise "the deductive logic of the natural sciences" (Amaratunga et al., 2002). Quantitative research designs have always been concerned with defining an epistemological methodology for determining the truth/value and are usually flexible in terms of dealing with data and allowing researchers to conduct comparative analysis, statistical analysis and repeatability of data collection in order to verify reliability (Amaratunga et al., 2002).

Creswell (2003) identifies some characteristics of quantitative research as follows: it viewing truthfulness or reality to exist in the world, which can be objectively and quantitatively measured, in terms of the relationship between the investigator and what is being investigated. The quantitative research paradigm suggests that the researcher should remain distant and independent of what is being researched to ensure an objective assessment of the situation.

Easterby-Smith (1991) and Amaratunga et al. (2002) identify some strengths of quantitative methodologies which include: allowing comparison and replication; reliability and validity may be determined more objectively than qualitative techniques; emphasising the need to formulate hypotheses for subsequent verification; helping to search for causal explanations and fundamental laws; and, generally reducing the whole to the simplest possible elements in order to facilitate analysis. Creswell (2003) further states that in quantitative research, concepts, variables and hypotheses are selected prior to the study and remain fixed all through the study as the aim of the study is to develop generalisations that contribute to the theory and enable a researcher to better predict and explain some phenomena.

However, Myers (2009) argues that a major disadvantage of quantitative research is that, as a general rule, many of the social and cultural aspects of the organisations are lost or are treated in a superficial manner. According to Saunders et al. (2009), quantitative data convey very little meaning to most people before they are processed and analysed. Quantitative analysis techniques, such as graphs, charts and statistics, allow researchers to

explore, present, describe and examine relationships and trends within data. Quantitative data can range from simple counts such as the frequency of occurrences to more complex data such as test scores, prices or rental cost. In contrast to quantitative approaches, qualitative methods look at ways of increasing the richness of the data about the social process in a research problem and tend to be subjective (Bryman, 1995).

4.5.2 Qualitative Method

Qualitative research is based on words rather than numbers (Miles and Huberman, 1994). Its designs are those that are associated with interpretative approaches from the informants rather than measuring discrete, observable behaviour (Minichiello et al., 1995). It is used to answer questions about the nature of phenomena with the purpose of describing and understanding those phenomena from the informant's point-of-view (Leedy, 1997). According to Cornford and Smithson (1996), qualitative research hesitates to adopt the scientific model of a generalisable objective product from the research endeavour, thus it is probably wrong to make the distinction between quantitative and qualitative research simply on the use or absence of numbers. Sykes (1990) ascertained that the strength of qualitative research lies in the flexible and responsive interaction between interviewer and respondents. Yin (2009) notes that qualitative research helps to explain complex issues, within the natural settings of the research phenomenon, in detail. Qualitative research mostly means "any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification" (Strauss and Corbin, 1990).

In qualitative research, meaning can be probed and topics can be covered easily from a number of angles. Questions are made clear for respondents, therefore Myers (2001) considers it to be an advantage for exploring concepts (construct or theoretical validity) and the relationships between them (internal validity). Similarly, Hakim (1987) states that the greatest strength of qualitative research is the validity of data obtained because individuals are interviewed in sufficient detail for the results to be taken as true, correct and believable reports of their views and experiences. The qualitative research paradigm is also referred to as a "constructivist", "naturalistic", "interpretative", "post-positivist" or "post-modern perspective" approach (Lincoln and Guba, 1985).

In a research context, where a certain topic has been little written about or studied, the qualitative method is usually used to provide an in-depth insight into the phenomena being investigated (Bryman, 1995; Myers 2009; Yin, 2009). Myers (2009) argues that qualitative research methods are designed to help researchers to understand people and what they say

and do. According to Patton (2001), qualitative research uses a naturalistic approach that seeks to understand phenomena in context-specific settings, such as a "real world setting where the researcher does not attempt to manipulate the phenomenon of interest". It is designed to help researchers understand the social and cultural contexts within which people live. Qualitative researchers contend that it is virtually impossible to understand why someone did something or why something happened in an organisation without talking to people about It. "*For example, if the police were restricted to using only quantitative data, almost no crimes would be solved. Also, if lawyers and judges were not allowed to question or cross-examine witnesses in court, the validity and reliability of any court decision would be thrown into serious doubt"*(Myers, 2009). Myers (2009) further advocates that if a researcher wants to understand people's motivations, their reasons, their actions and context of their beliefs and actions in an in-depth way, then qualitative research is best. Creswell (2007) identifies eight characteristics of qualitative research which are contained in H-7 in appendix H.

Qualitative research does not depend on the researcher knowing all the characteristics and categories of a subject ahead of time (Morse, 2003) but rather, allows concepts to be developed and refined as the research progresses. Myers (1997) and Oates (2006) further ascertain that qualitative research can be synonymous with positivist, interpretative or critical research paradigms. Zikmund (2003) states that there is no best research methodology but rather that the approach adopted depends on the research questions and research objectives that the research seeks to answer. In addition, the decision to adopt any research methodology is always a compromise between options and choices. Jenkins (1985) states that the key to selecting the best methodology consists of two factors: (1) awareness of the research aims and (2) recognition of the available methodologies and understanding their relative strengths and weaknesses. Furthermore, key strengths and weaknesses of quantitative and qualitative methods have been identified and are presented in H-5 in appendix H.

Galliers and Land (1987) suggest that before deciding on an appropriate research approach in the field of information systems (IS), a researcher should first consider the nature of ISs themselves and then look at what is expected to be gained from undertaking research in the chosen area. The authors further explain that IS is a meta subject that spans many disciplines in business, social sciences and sometimes, natural sciences. As a result, selecting an appropriate research approach is not usually a straightforward task. Similarly,

Orlikowski and Baroudi (1991) highlight the difficulties faced by researchers in IS. Unlike other disciplines, such as anthropology, psychology, sociology and their related fields, ISs have a limited number of research approaches. According to Gill and Johnson (1997), various factors influence the choice of different approaches as well as the nature and content of the research problem and the available resources. Hence, Crotty (1998) suggests it is vital to have a plan of action in every research. It is important not only to describe the methodology, but also give an account of the rationale it provides for the choice of methods and the particular forms in which the methods are employed (Crotty, 1998).

4.6 Justification of the Chosen Research Method

It is vital to describe a research method as specifically as possible (Crotty, 1998). The choice of a qualitative research mode for this study is consistent with the research's aim to ascertain a complex phenomenon by considering the context of its settings (Yin, 2009). Reasons for the choice of qualitative research method for this research were based on the research problem as identified in Chapter one, the researcher's epistemological stance and the level of uncertainty surrounding the phenomenon under consideration. Often, "what, how and why" questions are more appropriately examined using a qualitative research approach as highlighted below.

On the one hand, a qualitative research approach is able to accept complexity and subjectivity and enables the researcher to use his/her observations and interpretations of the phenomenon to gain insights and discover meaning about a particular experience, situation, cultural element or historical event (Myers, 2009). On the other hand, the quantitative research mode is not suitable for exploring or explaining such complexities, rather it is more appropriate for confirming what is already known about a phenomenon (Morse and Mitcham, 2002; Rolfe, 2006). Moreover, quantitative research only allows the researcher to familiarise him/herself with the problem or concept to be studied, and perhaps generate hypotheses to be tested (Golafshani, 2003).

Another reason for the choice of a qualitative research approach is based on the researcher's epistemology. According to Darlaston-Jones (2007), the ability to identify the relationship between the epistemological foundation of a research and the methods employed in conducting the study is critical in order for research to be truly meaningful. Therefore, the researcher adopted an interpretivist epistemological stance that aimed to identify factors that motivate/inhibit the adoption and effective utilisation of ICT in Nigerian SMEs and the influence of ICT on the SMEs' organisational performance, which

is also consistent with a qualitative research mode. Furthermore, an interpretivist paradigm is suitable for this research as it recognises the characteristics of SMEs and their functions in the Nigerian economy (Saunders et al., 2009).

Although the interpretivist approach raises questions on the generalisability of findings, Saunders et al. (2009) point out that generalisability is not of crucial importance as the aim of the research is to capture the rich complexities of the situation. Also, this research adopts an inductive rather than a deductive approach since it aims to understand deep meanings of the phenomena (Miles and Huberman, 1994), and theory building takes place after data collection and these are subsequently related to the literature (Saunders et al., 2009).

4.6.1 Research Design for the Study

The function of a research design is to ensure that the evidence obtained enables the researcher to answer the initial question as unambiguously as possible (de Vaus, 2001). This implies that the quality of a research project will be enhanced by a good understanding of the research design. The research design helps to reduce the ambiguity of much research evidence. A research design describes a flexible set of guidelines that connects theoretical paradigms to strategies of inquiry and methods for collecting empirical data.

Case study research strategy or design is ideal when a holistic in-depth investigation is needed (Tellis, 1997), and is intended to reveal facts from participants by using multiple sources of data such as face-to-face interviews, observation and written documents (Yin, 2009). The qualitative case study methodology provides tools for researchers to study complex phenomena within their contexts (Baxter and Jack, 2008). It allows the researcher to explore individuals or organisations through complex interventions, relationships, communities or programs (Yin, 2002) and supports the deconstruction and subsequent reconstruction of various phenomena. Case studies can be used in all types of research and primary data can be collected from cross-border and cross-cultural settings. According to Ghauri and Grønhaug (2005), “case study research is particularly useful when the phenomenon under investigation is difficult to study outside its natural setting and also when the concepts and variables under study are difficult to quantify.” Yin (2009) identifies five components of research design that are important for case studies, and these can be found in H-8 in appendix H.

4.6.2 Rationale for adopting the Case Study

Yin (2009) defines a case study as "an empirical inquiry that investigates a contemporary phenomenon in depth, and within its real-life context especially when the boundaries between phenomenon and context are not clearly evident". For this reason, phenomenon and context are not always distinguishable in real-life situations. Other technical characteristics including data collection and data analysis strategies are described as the second part of the technical definition of case studies (Yin, 2009). However, Myers (2009) argues that Yin's definition does not fit all case studies, especially within business disciples. In one respect, Myers (2009) argues that the definition is too broad, in another it is too narrow. Myers states that Yin's definition is too narrow in the sense that he advocates just one type of case study research which is perhaps best described as a positivist approach.

Thus, Myers (2009) defines case study with regard to business, as "a research that uses empirical evidence from one or more organisations where an attempt is made to study the subject matter in context. Multiple sources of evidence are used, although most of the evidence comes from interviews and documents." Myers (2009) further states that the purpose of a case study is to use empirical evidence from real people in real organisations, to make an original contribution to knowledge.

Likewise, Marrelli (2007) describes the case study as a data collection method in which in-depth descriptive information about specific entities or cases is collected, organised, interpreted and presented in a narrative format. Clardy (1997) defines a case study to be a richly detailed story about a specific situation or event in the workplace, describing who, what, where, when, and how. Again, Herling et al. (2000) describe the case study as a process of scholarly inquiry and exploration whose underlying purpose is to create new knowledge. It can also be thought of as a research strategy. As a strategy, Dooley (2002) claims that case study research attempts to examine a contemporary phenomenon and its associated contexts which are not clearly evident.

According to Cornford and Smithson (1996), the great strength of the case study is in the richness of data that can be obtained by multiple means when researchers do not restrict themselves to a single situation. Case study research has the ability to embrace multiple cases, to embrace quantitative and qualitative data and to embrace multiple research paradigms (Dooley, 2002). Hakim (1987) and Gillham (2000) also consider case study methodology as the most flexible form of research design, allowing different techniques of

data collection to offer the possibility of a more elaborate study with a more global perspective.

Similarly, Dubé and Paré (2003) advocate that case research typically combines several qualitative data collection methods such as interviews, documentation and observations, but can also include quantitative data such as questionnaires and time series. A variety of data collection methods is employed in case study research. Collecting different types of data from different sources produces a wider scope of coverage and may result in a fuller picture of the phenomena under study (Bonoma, 1985).

Furthermore, Benbasat et al. (1987) highlight several reasons why the case study strategy is a preferred choice for many IS researchers. First, the researcher can quickly study IS in a natural setting, and generate theories from practice. Second, the case method allows the researcher to answer "how" and "why" questions, i.e. to understand the nature and complexity of the processes taking place. Third, a case approach is an appropriate way to research an area in which few previous studies have been carried out.

This research adopts a qualitative research technique using a case study design to explore the phenomenon of ICT adoption and utilisation within Nigerian SMEs by identifying some motivating and inhibiting factors behind ICT adoption, as well as the effective utilisation of most especially, sophisticated ICT applications/systems in their natural settings. The natural setting in this case is the place (Lagos) where the researcher discovers or uncovers what is to be known about the phenomenon of interest (Maykut and Morehouse, 1994). The use of the case study, as described by Baxter and Jack (2008), enables the researcher to explore differences within and between cases and it provides rich contextual data (Levy and Powell, 2000). Besides, the case study has been identified by researchers (e.g. Benbasat et al., 1987; Galliers 1992; Alavi et al., 1992; Myers, 1997) as a typical research strategy widely used for qualitative data collection in IS/IT research. This is because it has multiple perspectives which are rooted in a specific context and provide multiple data collection methods (Wu, 2007).

Furthermore, the use of a case study methodology in this research complements and extends the trends revealed within the quantitative survey undertaken in the first part of this study. Silverman (2000) stresses that quantitative surveys exclude the observation of everyday behaviour unlike the use of case studies which constitute a comprehensive, rigorous and coherent research tactic that enhances academic knowledge. In the second

part of this study, information was acquired by interviewing the owners/managers and other key parties in some selected SMEs and information obtained from the interviews was recorded. Thus, the case study method assisted to clearly understand the nature and complexity of the processes that were taking place (Benbasat et al., 1987). Eisenhardt (1989) and Miles and Huberman (1994) advocate that the flexibility offered in case study design allows aspects such as the number of cases or scope of cases to be modified over time.

According to Denscombe (2007) "The decision to use case study approach is a strategic decision that relates to the scale and scope of an investigation, and it does not at least in principle, dictate which method or methods must be used. Indeed a strength of the case approach is that it allows for the use of a variety of methods depending on the circumstances and specific needs of the situation". Denscombe (2007) argues that the use of the case study can either be discovery led or theory led. On the one hand, it is discovery led when it describes what is happening in a case study settings (e.g. events, process and relationships), explores the key issues affecting those in a case study setting (e.g. problems and opportunities) or compares setting to learn from the similarities and differences between them. On the other hand, it is theory led when it explains the causes of events, processes or relationships within a setting, uses a case study as an illustration of how a particular theory applies in a real life setting and finally, when it uses a case study as a test-bed for experimenting with changes to specific factors (or variables).

Dooley (2002) acknowledges that the case study is one method which excels at bringing people to an understanding of a complex issue which can add strength to what is **already known through previous research.** Case study research generally does not lend itself well to generalisation or prediction, thus the researcher who embarks on a case study research is usually interested in a specific phenomenon and wishes to understand it completely, not by controlling variables but rather by observing all of the variables and their interacting relationships. Thus, Dooley (2002) concludes that case study research can contribute to all phases of theory development in a holistic way. Oates (2006) has identified four major characteristics of case studies which are contained in H-9 in appendix H.

The exploratory case study approach was selected for this research. Exploratory case study is used to explore those situations in which the intervention being evaluated has no clear, single set of outcomes (Yin, 2002 and 2003). An exploratory study can be used where

there is little in the literature about a topic so a real life instance is investigated in order to identify the topics to be covered in subsequent research project (Oates, 2006). The exploratory case study is appropriate for answering research questions that seek to establish how an outcome can be derived (Okunoye et al., 2007). Furthermore, Amaratunga et al. (2002) and Hussey and Hussey (2003) state that exploratory case studies could be utilised in order to study areas where knowledge is deficient.

The research employed the exploratory case study as it can be used where there is little in the literature about a topic in a specific context (i.e. Lagos, Nigeria) thereby allowing a researcher to gain more information about the topic which people may know little about (Oates, 2006) and can also provide a platform upon which a further research project can be built. Exploratory research is conducted when a problem has not been clearly defined or solved, or its real scope is not yet clear (Lake, 2009). It also helps to determine the best research design, data collection and selection method (Lake, 2009).

4.7 Selection of Cases for the Study

Selection of cases represents another important, but difficult aspect of case study research (Benbasat et al., 1987; Lee, 1989; Eisenhardt, 1989; and Yin, 2002). Eisenhardt (1989) points out that the selection of cases is a significant issue for building theories from case studies as such research is built on a theoretical background rather than random sampling. According to Eisenhardt, the underlying logic for case selection is replication and theory extension.

Dyer et al. (1991) argue that the number of case studies that will be conducted depends on how much is known about the phenomenon and how much information can be uncovered by including additional cases. Hence, Eisenhardt (1989) suggests that **four to ten** useable sites are necessary for case research, depending on the number of critical causal variables proposed.

Miles and Huberman (1994) further note that investigating similar and contrasting cases adds more value to research findings by helping to provide different pictures of the studied phenomenon. Daymon and Holloway (2002) and Robson (2002) recommend the use of multiple case studies where investigations allow the researcher to identify distinctive features by exploring the similarities and contrasts between different cases. For this research, the opinions of the case study participants offer useful insights which help to understand and explain the route to ICT adoption in a number of SMEs representing

different sectors, but specifically focusing on SMEs situated in Lagos, a metropolitan city in Nigeria.

Yin (2009) advocates that the use of multiple cases can assist to provide **a distinct framework** for the subject under consideration rather than producing generalisable results. Again, evidence from multiple cases is often considered more compelling, and the overall study is therefore regarded as being more robust (Herriott and Firestone 1983, Remenyi et al., 1998). Although, some researchers assume that multiple-case studies have a drawback because they reduce the attention of the researcher and may result in a weakening of the case studies (e.g. Wolcott 1994), others such as Yin (2009) note that the strength of generalisation may be increased with a number of cases.

Merriam (1998) confirms that multiple cases in a study is a common strategy that enhances the external validity or generalisability of findings. Bryman (2008) notes that one of the advantages of employing a multiple-case study design is to improve theory building. According to Bryman (2008), "By comparing two or more cases, the researcher is in a better position to establish the circumstances in which a theory will or will not hold". Perry (1998) supports the use of multiple cases as well, especially in postgraduate research, as they enable cross-case analysis for richer theory building.

Random sampling is not recommended in case study research because it may not represent the "real world" context of the cases (Tellis 1997). According to Marshall (1996), studying a random sample provides the best opportunity to generalise the results to the population yet, it is not the most effective way of developing an understanding of complex issues relating to human behaviour. Eisenhardt (1989) and Patton (1990) are of the opinion that random sampling may lead to data skewed to a particular subgroup and then introduce sampling error, so it is not recommended. Stake (1995) advises researchers if possible, to select cases that are both easy to get to and hospitable to the research inquiry. This type of selection is referred to as "**purposeful sampling**".

Purposeful sampling is described by Merriam (1998) as the most common sampling method used in selecting such cases. With purposeful or purposive sampling, the sample is "hand-picked" for the research (Denscombe, 2007). The term is applied to those situations where the researcher already knows something about the specific people or events and deliberately selects particular ones because they are seen as instances that are likely to produce the most valuable data. In effect they are selected with a specific purpose in mind

and that purpose reflects the particular qualities of the people or events chosen and their relevance to the topic of the investigation (Denscombe, 2007).

According to Merriam (1998) "purposeful sampling includes determining selection criteria that are essential in choosing cases to be studied as the criteria reflects the purpose of the study and guide the researcher to the identification of information-rich cases". Convenience sampling is a type of purposeful sampling in which the selection of a sample is based on time, money, location and/or the availability of case studies. Merriam (1998) further recommends two steps to finding the best case to study: first, setting-up or deciding criteria that will guide case selection and second, selecting a case that fits those criteria.

4.7.1 Seven Cases Selected for the Study

This study selects seven case studies, investigating a single issue in all the firms, in order to make possible a generalisation of some of the study's conclusions. The seven case studies contribute to a larger picture identifying factors affecting ICT adoption in Nigerian SMEs. A survey method or strategy was used to complement the case study research in terms of gathering the right sample. A survey was conducted in the first phase of the research in which 25 SMEs were identified to be interviewed. In the second phase of the research, semi-structured interviews were conducted with the 25 SMEs from which seven were finally selected and used as cases for the purpose of this research. The research employs cross-case analysis for richer theory building.

A decision was taken to restrict the scope of this research to SMEs that met certain pre-set criteria established by the researcher. All companies had to conform to Nigeria's definition of SMEs as defined by SMEDAN (see Chapter one), which is measured by the number of employees and turnover. Moreover, all the selected cases are all operating in Lagos and were selected based on their level of ICT use/utilisation and were also considered to be the most hospitable to the research inquiry as suggested by Stake (1995). Furthermore, the seven selected companies were the most appropriate based on their understanding of the topic and vast knowledge about the subject in general, hence were considered as SMEs that were likely to produce the most valuable data (Denscombe, 2007).

In addition, the mission statements of the seven companies were considered as criteria because, interestingly, their intentions to use various ICTs to conduct or carry out their businesses were stated in their mission statements. According to Thompson and Strickland (1996 in Bart and Hupfer, 2004), a mission statement defines a company's business and

provides a clear view of what the company is trying to accomplish for its customers. The seven cases were selected from various industries in order to enhance the applicability of results.

4.7.2 Reasons for Selecting the Current Research Location

This study focuses upon Nigeria which is a particularly interesting context and domain for the research as it is one of the most industrialised countries in sub-Saharan Africa. Moreover, Nigeria is the most populated nation in Africa and is endowed with significant natural resources. The telecommunications industry is rapidly advancing in Nigeria yet it is believed that ICT deployment is not increasing at the same pace. The Economic Commission for Africa (2005) indicated that many countries in Sub-Saharan Africa (SSA) are still technology backward including Nigeria. Despite the increased uptake of ICT in the world, Nigeria continues to lag behind in their adoption/utilisation of ICT, hence there is need to pull Nigeria out of this divide thereby helping to increase the uptake of ICT in SSA. Although it is known that Nigeria is an oil rich country, the country's growth is hindered by several factors including the slow development of the SME sector with respect to their use of ICT.

Besides, Nigeria is a classic and significant example of a country in SSA (see Chapter 2). The estimation is that one in five Africans is a Nigerian (World Bank, 2004). Nigeria's population was estimated to be about 158.3 million in 2011 (Trading Economics, 2011), with an urban population of 48.2% and an annual growth percentage change of 2.27% between 2005 and 2010 (World Internet Stats, 2010). Although, Abuja is the Federal Capital of Nigeria and the seat of government, the researcher decided to concentrate on SMEs in Lagos State since Lagos is considered to be the commercial and industrial nerve centre of Nigeria. Also, Lagos is the former Federal Capital territory of Nigeria. Despite the fact that the Federal Capital has been moved from Lagos to Abuja, Ojo (2004) advocates that Lagos still remains the commercial, financial and business headquarters of Nigeria.

Similarly, Lawal (2002) and Onuorah (2009) note that Lagos is considered to be the commercial nerve centre in Nigeria given its strategic location, peculiar demographics and contribution to the national GDP. Over 60% of industries are located in Lagos, thus the city epitomises the commercial characteristics of Nigeria. Local and International industries are mostly situated in Lagos and the viable sea port of Tin Can Island and Apapa Wharf are both located in Lagos. The human population ratio of Lagos is far greater than

Abuja and Lagos is Nigeria's largest city. In addition, activities of the banking sector and the Nigerian stock exchange could be considered far greater in Lagos than any other city in Nigeria as all the Nigerian banks' head offices are situated in Lagos. Mabawonku (2006) describes Lagos as one of the richest States in the federation, likely to have more resources and a good work environment. Based on the reasons identified above, focusing on SMEs in Lagos was considered more useful for this study.

4.7.3 Unit of Analysis for the Study

The unit of analysis is related to the research questions of the study (Yin, 2003). Yin (2003) identifies different units of analysis such as holistic single case, embedded single case with multiple units of analysis, multiple case with multiple units of analysis or multiple case with one unit of analysis. In this research, the main unit of analysis is the SMEs. The research adopted an inductive, qualitative approach based on multiple case studies, using each SME as a unit of analysis (Yin, 2003).

4.8 Data Collection and Analysis for the Research

The methods employed in collecting and analysing data are presented in the following sections.

4.8.1 Data Collection

In order to answer the research questions, it is essential to obtain sufficient and relevant data through appropriate research methods. Bell (2005) suggests a need for the research approach to be effective in order to resolve the problem. Tellis (1997) comments that although case studies tend to be selective by focusing on one or two issues which are fundamental to understanding the system being examined, however they are regarded as a triangulated research strategy. Likewise, Yin (2009) emphasises the need for triangulation which arises from the ethical need to confirm the validity of the processes. For case studies, triangulation can be done by using multiple sources of data (Yin, 2009).

In this research, data collection was carried out through a wide variety of techniques including documentation, observations, semi-structured interviews and questionnaires, in order to identify and allow a detailed understanding of the research topic. Dooley (2002) advocates that the power of case study research includes the ability to use all methodologies within the data-collection process and its ability to compare within a case and across cases, for the purpose of research validity.

Also, Denscombe (2007) identifies that questionnaires can be used to provide information on a particular point of interest in a case study research. The author further notes that a strength of the case approach is that it allows for the use of a variety of methods depending on the circumstances and specific needs of the situation. Mintzberg (1979) describes the use of both types of data (quantitative and qualitative) as synergistic because quantitative data are used to establish the relationships and qualitative data are used to "uncover relationships" achieved from quantitative data. Following an extensive review of the literature in Chapter three, this research has undergone two phases of data collection as explained in the following two sections.

4.8.1.1 Survey

The survey is a technique widely used for quantitative data collection in IS/IT research (Straub, 1989; Pinsonneault and Kraemer, 1993) and can be used for exploration, description or explanation purposes (Pinsonneault and Kraemer, 1993). Bryman (2001) indicates that survey is an appropriate means of collecting data under three conditions: (i) when the goals of the research call for quantitative data, (ii) when the information sought is reasonably specific and familiar to the respondents, and (iii) when the researcher has considerable prior knowledge of particular problems and the range of responses likely to emerge.

Surveys are widely accepted and used in the field of IS and are designed to present a snapshot of how things are at a specific time (Kelly et al., 2003). Galliers (1992) argues that survey questionnaires are a good means of looking at a far greater number of variables than is possible with experimental approaches. Hence, surveys can provide reasonably accurate descriptions of real world situations from a variety of viewpoints. However, there are some drawbacks associated with survey research; for example, little insight is usually gained regarding the cause or the processes behind the phenomenon under study. The planning and conducting of a survey can be broken down into six different activities as identified by Oates (2006): data requirements, data generation, sampling frame, sampling technique, response rate and non-responses, and sample size.

Data were gathered by distributing self-administered questionnaires to SMEs in Lagos between December 2009 and February 2010. Kumar (2005) describes a questionnaire as a list of questions whereby answers of respondents are recorded. In a questionnaire, respondents read the questions, interpret what is expected and then write down their answers. Saunders et al. (2000) argue that the most suitable way of conducting a survey is

by using a questionnaire. Oates (2006) states, however, that although many people automatically assume that a survey uses a questionnaire for its data generation method, surveys are also possible using other data generation methods such as interviews, observations and documents.

The self-administered method was chosen as the suitable method of data collection due to the poor postal system in Nigeria. Also, there are unclear and insufficient addresses of SMEs available from the various governmental associations. Therefore, in order to avoid delays, it was decided by the researcher to locate the SMEs in person. Although the self-administered method is expensive and time consuming, it does ensure a high response rate and enables the researcher to explain in detail the aims and objectives of the research as well as clarify unclear questions (Alqahtani, 2000).

A questionnaire and a covering letter (see Appendix A and B) were delivered to 200 SME owners/managers across different sectors in the region, explaining the purpose of the study, outlining the benefits of completing the questionnaire and reassuring the respondents of the confidentiality of their data. The questionnaire, consisting of two sections, was developed based on the literature review. Section one collected general information about the SMEs, while section two determined whether or not the SMEs were currently utilising ICT. Successful adopters/users of ICT were further requested to specify the types of ICT applications/systems that were being utilised in their various organisations. It was also necessary to measure the general knowledge of ICT amongst employees in the participating SMEs as a guide to help understand the reasons for their adoption or non-adoption, as well as their level of utilisation.

In most cases, SME owners or managers were willing to respond to the questionnaire on the first visit. Nevertheless in some cases, the researcher was asked to call back at a particular time that was convenient for them. One month later, visits and follow up calls were made to SMEs that had not replied to the survey by the deadline given on the questionnaire. In total, 105 questionnaires were returned of which 66 were properly completed. Respondents consisted of owner-managers, managing directors, administrative managers/officers and IT managers/officers. Thirty-nine questionnaires were not properly completed due to either company policies or for other reasons best known to some of the SMEs. The second method of data collection for this research is based on interviews as described below.

4.8.1.2 Interviews

Putins and Petelin (1996) argue that interviews are an extremely important form of communication in society. They are a means by which information is exchanged between individuals and successful communication is achieved. Although interviews are essentially an exchange of information, nonetheless Dwyer (1993) distinguishes interviews from casual conversations on the basis that interviews are planned, prearranged, structured, controlled by the interviewer, have a predetermined purpose and take place between two or more people of different status. Marshall and Rossman (1999) suggest that when a research has a descriptive and exploratory focus, as it has in this research, the appropriate research strategies should be field studies comprising in-depth interviews.

For this research, semi-structured interviews were used in conjunction with the self-administered questionnaires to aid better interpretation of the results. The interviews assisted in gaining in-depth understanding of some of the issues outlined in the self-administered questionnaire. Walsham (1995) and Levy and Powell (2003) acknowledge that interviews are a key feature of successful cases as they provide the best access to interpretations and views of participants regarding actions and events which have taken place. Gillham (2000) highlights that semi-structured interviews are highly flexible and are also regarded as "the most important form of interviewing in case study research".

In this research, as earlier stated in section 4.8.1, semi-structured interviews were initially conducted with 25 SMEs in Nigeria between December 2009 and February 2010 from which seven SMEs were finally selected and used as case studies, and an interview protocol was used as a guide. An advantage of the interview guide is that it helps the researcher to carefully decide how best to use the time available in an interview as agreed by Wu (2007). The interview questions are contained in appendix D.

The interviews began with the researcher introducing herself and also giving a brief description of the objectives of the study. Questions related to the background detail of the each participant as well as that of the companies were among the first set of questions asked. Also some questions were focused on the types of software applications that were in use in the different SMEs (e.g. spreadsheets; databases; accounting packages; statistical packages; communication software used for internet, email, word processing software, and so on) and the use of other ICT applications (such as stock control, Sage, CRM, ERP amongst others).

A section of the protocol concentrated on questions regarding ICT adoption and utilisation such as benefits of the use of ICT, factors affecting the adoption and effective utilisation of ICT amongst others, so as to obtain respondents' views on the extent to which a number of factors inhibit the adoption and effective utilisation of ICT applications, and also determine the extent to which these SMEs utilise sophisticated ICT solutions. Again, a section of the protocol determined whether or not the SMEs were willing to adopt more sophisticated ICT applications in future. Likewise, questions regarding business competition were asked as this assisted in determining the extent to which the respondents understood their business environments and the nature of competition. These attributes have been used previously by researchers to measure the impact of the environment on IS utilisation (e.g. King and Sabherwal, 1992; Miller, 1988).

Furthermore, the interview questions were open-ended, hence respondents were given the opportunity to offer their views in their own terms. According to Wu (2007), semi-structured interviews with open-ended questions assist in collecting field data regarding organisational issues in IS. Participants were always encouraged to elaborate on their answers and to cite examples where possible. Yin (2009) states that in a case study, it is important to have open questions to enable interviewees to explain their views on a situation. The use of semi-structured interviews not only assisted in presenting the participants' perceptions of the issues under investigation but also, provided an opportunity for the interviewer to ask for further clarification and elaboration of answers. Bell (1993) affirms that the use of semi-structured interviews enables the collection of rich data as they are regarded as a useful method of encouraging the discussion of issues that may have otherwise not have been identified in the questionnaires.

The duration of the interviews on average, was 1 hour each with the shortest interview being 30 minutes and the longest being 1hour 30 minutes. All the interviews were conducted in English. Participants were given time to answer the questions and the researcher did not attempt to interrupt the participants as they responded. Towards the end of each interview, the researcher encouraged open discussion, allowing the interviewee to ask questions and add any comments they might wish to include. Yin (2009) recommends that interviews should be guided conversations rather than structured queries. In other words, even though the researcher is pursuing a consistent line of enquiry, the actual stream of questions in a case study interview should be fluid rather than rigid (Yin, 2009).

Interviews were conducted with the owners, managers or managing directors of the selected SMEs, IT managers and officers, administrative managers/officers and some other employees wherever possible, since multiple interviews in each company can help to achieve a broader perspective and further assist in achieving data triangulation (Brun et al., 2006). This also helps to provide a "holistic view" of the research topic. Prasad (2009) suggests that it is important to include employees and managers from different hierarchies in the organisation and at a site where the groups must have had fundamental ICT investments. Prasad (2009) comments that a researcher should study organisations that are known to be at the forefront of ICT usage, as the themes that emerge from these organisations are most likely be used to characterise a wide range of organisations.

The interviews were tape-recorded and transcribed afterwards. Recording the interviews did not present any challenges from the participants as they were asked to indicate their willingness to participate in the exercise by signing and returning a declaration form. According to Miles and Huberman (1994), tape-recording of interviews is often suggested as a means of providing a complete description of interviews, responses and comments.

The interviews were transcribed immediately after each interview and written up while the interview was still fresh in the mind of the researcher. This enabled the researcher to clarify the information acquired and also to decide what information was required in the writing up. Thus, transcription was carried out on the same day as the interview after which summaries of the transcripts were produced and sent to each participant asking them to check for accuracy and correct interpretation. This served as a means of controlling bias and producing reliable data, as recommended by Saunders et al. (2009). Table 4.1 summarises the critical characteristics of the case study and survey methods adopted in this research.

Table 4.1: Critical characteristics of case study and survey method (Lillis and Mundy**,** 2005 in Ramli et al., 2009).

	Case Study	**Survey**
Uses of method	Explore and explain existence of phenomena in the case. Compare and contrast nature of phenomena in different contexts.	Complement and extend case study finding. Evaluate extent of phenomena and relations between th**e**m.

Complexity of phenomena studied	High	Low
Sampling rationale	Theoretical replication	Statistical generalizability
Sampling	Non-random	Random
Sample size	Small	Large
Preciseness/Measurability of existing constructs	Low	High
Usual method of data analysis	Qualitative	Statistical

A discussion containing the analysis of data obtained from the survey and interviews is presented in section 4.10.

4.8.1.3 Other methods of Data Collection

Two other forms of data collection methods were used for this research, i.e. other than questionnaires and interviews. They include the use of documents and observation, to support and confirm the interview data. According to Denscombe (2007), a strength of the case study approach is that it not only allows the researcher to use a variety of sources, a variety of types of data and a variety of research methods as part of the investigation, but also observation of events within the case study setting can be combined with the collection of documents from official meetings and informal interviews with the people involved.

4.8.1.3.1 Documents

The researcher made use of the documents of some of the companies that were interviewed. Documentation was used to form the basis for understanding the background of the case study companies, the roles of the senior personnel and the workflows within the company. Furthermore, information on some of the documents was used to confirm, and as an add-on to, the evidence gathered from other sources. The review of some company's documents enabled the researcher to probe further in order to confirm some details, thereby avoiding contradictions. Inferences were also gathered from documents which at a later stage served as suggestions for further investigation.

Documents read during the researcher's stay in the companies typically included memoranda, agendas, minutes of meetings, progress reports, administrative documents,

newspaper articles and so on. This assisted in providing further evidence to other data collected via interviews and surveys, although Yin (1994) states that researchers must not regard documents and records as a pure account of facts that have happened. However, Myer (2001) states that the use of documents is important because they can be used as inputs to the interview guide and used to identify statements made by key people in an organisation. The use of documents can also be helpful in counteracting biases of interviews. Analysis of the documents assisted in understanding the reactions and feelings captured in the survey and interviews, ensuring results were placed in the right context (Grainger and Tolhurst, 2005). Moreover Bryman (1989) notes that analyses of documents and records help to examine the validity of information obtained by other methods and can also provide further information on issues that the researcher is interested in gathering. The documents were analysed bearing in mind the aim of the research. This was done by carefully reading the documents in order to understand the general focus of each of them. Afterwards, the researcher focused on key information that was relevant to the present research and then incorporated that information in the report since the major reason for reviewing the documents was to back up facts already obtained from the interviews.

4.8.1.3.2 Observation

Observation is a methodology consisting of watching what people do, listening to what they say and sometimes asking them to clarify certain issues. Stake (1995) and Gillham (2000) identify the benefits of engaging in observation which include looking at what people actually do, rather than what they say they are doing, or why and how they should be doing it. Data were captured by carefully observing the activities in the various companies and keeping field notes bearing in mind the aim of the research. The field notes were then written up and further compared with the information provided by the participants during the interviews.

This method of data collection gave the researcher some added advantage in terms of observing the manner in which the owners/managers especially, deal with clients, suppliers and employees, while they tried to complete the questionnaires. Adler and Adler (1994) argue that the major strength of direct observation is the fact that it is unobtrusive and does not require direct interaction with participants. Observation produces rigour when it is combined with other methods (Myers, 2001) and can illuminate the discrepancies between what people say in the interviews, casual conversations and what they actually do

(Pettigrew 1990). It also helps to observe things that may routinely escape conscious awareness among participants (Kunda, 1992).

According to Waddington (1994), the value of observational data is of substantial importance since it can assist the researcher to learn some aspects of organisational cultures in the various firms. Although questionnaires and interviews provide data about the perceptions of the participants, they do not provide data about what actually takes place in the SMEs (Patton, 2001). Chapelle (2003) highlights that "one approach to understanding technology use is to carefully observe learners at work". In the discussion chapter, the researcher used a narrative description as suggested by Nunan and Richards (1990) to explain what was observed within the SMEs alongside findings from the interviews. Yin (2009) stresses that the case study approach combines data collection methods such as archives, interviews, questionnaires and observations, and further recommends the use of case study protocol as part of a carefully designed research project.

4.8.1.4 Case Study Protocol

A case study protocol was developed and used as a guide for the research as recommended by Eisenhardt (1989), Stake (1995), and Yin (2003) which served as a detailed master plan. Lubbe (2003) describes the case study protocol as a document in which full details of the case study research design including details of the questions to be asked, field procedures for the researcher, details of all types of evidence required, as well as the structure of the final research, must be specified. A case study protocol is essential in a multiple-case study and desirable in a single-case study and has to be created prior to the data collection phase. Yin (2009) describes the protocol as a major component in asserting the reliability of the case study research.

The case study protocol for this research included; the background research which identified previous research on the topic and defined the key research questions; the research design that acknowledged the use of multiple cases; data collection based on a plan; background research on analysis which identified the strategy for data analysis; and interpretation of the findings and the role of the researcher which described the approach that was adopted for the study. The protocol also ensured triangulation and validation of data by utilising various methods of data collection and requesting participants to comment on interview transcripts. Also there was enfolding of the literature by comparing the research findings with existing literature (Eisenhardt, 1989). Furthermore, the research employed the concept of theoretical saturation where the researcher stopped searching for

more data in each case, especially when the extra information obtained only provided a minimal improvement to the existing data already gathered (Eisenhardt, 1989). Finally, there was report writing that involved identifying the audience, determining the best structure, organising and writing the report. A pilot study was also conducted at the initial stage of the research before the main enquiry (survey and case studies).

4.8.1.5 Pilot Study

A pilot study is described by Sarantakos (2005) as a small scale replica of the main study intended to discover possible weaknesses, inadequacies, ambiguities and problems in all aspects of a research, so corrections can be made before actual data collection takes place. Oppenheim (1992) suggests that the respondents in a pilot study should be similar to those in the main enquiry, i.e. they should be a judgement sample. For this study, the questionnaire was piloted by the researcher in November 2009 based on convenience.

4.8.1.5.1 Pilot Sampling

Yin (2009) notes that convenience, access and geographic proximity can be the main criteria for selecting a pilot case or cases. A total of 30 questionnaires were distributed to SMEs in Lagos of which 13 were returned and a sample of two SMEs selected and used as pilot case studies, based on their willingness to participate. The owners/managers of the two SMEs were interviewed alongside the managers of both companies' IT departments. Oppenhiem (2005) and Zikmund (2000), amongst others, have identified the importance of conducting a pilot study which includes: to estimate the costs and duration of the main study; to test research methods and research instruments and their suitability; to determine whether the sampling frame is adequate; to estimate the level of response, to familiarise researchers with the research environment in which the main study is to be conducted; and, to provide an opportunity for the researcher to practice the research before the commencement of the main study.

Conducting the pilot study prior to the main study offered the researcher the chance of re-conceptualising the objectives of the research in preparation for the main fieldwork and analysis. Yin (2009) stresses that a pilot case study, for example, will help to refine a researcher's data collection plans with respect to both the content of the data and the procedures to be followed. Again, it helps to identify any problems that the respondents may have in understanding the questions and the validity of the responses received.

4.8.1.5.2 Feedback from Pilot

In this study, whilst participants found some questions difficult to answer, they considered the instructions to be clear and easy to understand. However, the two owners/managers commented on the length of the questionnaire. They suggested that a shorter version would be easier to complete and might aid better co-operation. Hence, after reviewing and analysing the questionnaires from the pilot study, certain questions were deleted and some refined which assisted in preventing ambiguity and misunderstanding.

Nevertheless, there were some difficulties experienced by the researcher while conducting the pilot study which included:

1. One of owner/manager was always very busy so, the researcher was obliged to make several visits to the company in order to arrange a convenient time.

2. It was observed that one of the owner/manager had no background knowledge of the subject, thus the researcher kept emphasising the importance of conducting the study.

3. There was a kind of unease among three of the participants because they were unclear if the researcher was honest, however one participant was very confident. Thus, the researcher provided her identity card together with the covering letter in order to allay their concerns.

Having described the methods employed in gathering the data for this research and the steps taken to conduct a pilot study, the next section discusses the strategy adopted for analysing the data.

4.9 Data Analysis for the Study

Data analysis is the process of bringing order, structure and meaning to the mass of collected data (de Vos et al., 2002). Firstly, a structured literature review was conducted in order to provide the academic foundations of the research after which content analysis and descriptive statistics were utilised to analyse quantitative data in the first phase of the data collection, mainly to identify SMEs that use ICT in the region. Content analysis involves establishing categories and then counting the number of instances when those categories are used in a particular item of text for instance, a newspaper report. According to Joffe and Yardley (2004 in Marks and Yardley, 2010), content analysis is the accepted method of investigating texts and results in a numerical description of features of a given text or series of images. It is a familiar method in quantitative research, hence Silverman (2006)

emphasises that it is important to distinguish how content analysis is used in qualitative study. On the other hand, Taylor (2005) comments that descriptive statistics are used to describe quantitatively how particular characteristics are distributed among a group of people and that researchers use descriptive statistics when reporting the findings of a study. Descriptive statistics are used to organise and present data in summary form (Taylor, 2005).

4.9.1 Thematic Analysis

In the second phase of the research, the data obtained were analysed using the principles of **thematic analysis** often referred to as **template analysis** by Crabtree and Miller (1999), King (2004), Waring and Wainwright (2008), and Miles and Huberman (1994). Thematic analysis provides a framework that captures the richness of data and also helps organise the data collected into a structure (Crabtree and Miller, 1999). Thematic analysis is a process that can be used in qualitative research to translate qualitative information into quantitative data if this is desired by the researcher (Braun and Clarke, 2006). It is a method used in identifying, analysing and reporting patterns (themes) within data (Braun and Clarke, 2006). According to Boyatzis (1998), thematic analysis can be used as a way of seeing, a way of making sense out of seemingly unrelated material, a way of analysing qualitative information, a way of systematically observing a person, an interaction, a group, a situation, an organisation or a culture and a way of converting qualitative information to quantitative data. Thematic analysis shares many principles and procedures of content analysis (Joffe and Yardley, 2004 in Marks and Yardley, 2010).

Boyatzis (1998) describes thematic analysis as the process of encoding information that requires explicit codes which may be a list of themes. A theme is a pattern found in the information that at minimum describes and organises the possible observations and at maximum interprets aspects of the phenomenon (Boyatzis, 1998). According to Braun and Clarke (2006), a theme captures something important about the data in relation to the research question and represents some level of patterned response or meaning within the data set. Thematic analysis involves searching across a data set (e.g. a number of interviews or focus groups, or a range of texts) to find repeated patterns of meaning (Braun and Clarke, 2006).

Boyatzis (1998) characterises thematic analysis not as a specific method but as a tool to use across different methods. Miles and Huberman (1994) note that to make results from qualitative research accessible to others, a researcher must employ different ways of

organising and presenting data. Thematic analysis can be a beneficial bridge between researchers of varying orientation and fields (Denzin and Lincoln, 1994; Miller and Crabtree, 1992). It allows a researcher using qualitative method, to more easily communicate his or her observations, findings, and interpretation of meaning to others who are using different methods. Wolcott (1994) states that descriptive use of thematic analysis is desirable if the methodology chosen for the study requires it. Furthermore, Wolcott (1994) notes that descriptive or interpretive methodologies do not preclude scoring or scaling of themes and then using numeric representation to check consistency of judgements, neither do they preclude using the information to portray the themes and describe the unit of analysis. Often both aspects of thematic analysis enhance the clarity of results or findings and ease of communication (Wolcott, 1994).

Although, content analysis is another method that can be used to identify patterns across qualitative data and is sometimes treated as similar to thematic approaches (Wilkinson, 2000), it tends to focus at a more micro level, often provides (frequency) counts, and allows for quantitative analyses of initially qualitative data (Ryan and Bernard, 2000). Thematic analysis differs from content analysis in that themes tend not to be quantified (although sometimes they may be) and Boyatzis (1998) suggests thematic analysis can be used to transform qualitative data into a quantitative form, and subject them to statistical analyses. Nevertheless, Braun and Clarke (2006) state that the unit of analysis tends to be more than a word or phrase, which it typically is in content analysis.

4.9.1.1 Advantages

Braun and Clarke (2006) also identified some advantages of thematic analysis which include: flexibility, a relatively easy and quick method to learn, it's accessible to researchers with little or no experience of qualitative research, results are generally accessible to educate the general public, it's a useful method for working within participatory research paradigm, it can be used to summarise key features of a large body of data and offers a "thick description" of the data set, can highlight similarities and differences across the data set, can generate unanticipated insights, allows for social interpretations of data and can be useful for producing qualitative analyses suited to informing policy development. Thematic analysis also help researchers to produce codes (templates) which represent themes identified in their textual data (King, 2004 in Cassell and Symon, 2004).

4.9.1.2 Application

For this research, data were grouped into themes in order to analyse the data obtained from the interviews more effectively. According to Ryan and Bernard (2003), identifying themes is an important step before analysis. Bulmer (1979) claims that the themes for analysis can be found in literature reviews and researchers' values. According to Holliday (2002), the themes can come from what the researcher sees during data collection and the researcher's mind through the process of the research. In this research themes were identified by looking across the entire data set and identifying a repeated pattern of responses, as suggested by Braun and Clarke (2006). Some of the themes include:

1. Current state of ICT within SMEs - The aim was to establish the current status of ICT usage within the SMEs and to establish whether basic or sophisticated technologies were in use.

2. Decision making process - The aim was to gain an understanding of the ICT decision making process within the SMEs. Who makes the decisions and who also maintains the ICT infrastructures?

3. ICT barriers - The aim was to establish the barriers that prevent SMEs from further adopting or implementing sophisticated/advanced ICT applications or systems in their various organisations.

For analyses of the interviews data, the three main steps of data analysis, as suggested by Miles and Huberman (1994) were employed. These are: data reduction, data display and conclusion drawing/verification.

4.9.2 Data Reduction

This step in the data analysis procedure is comprised of data abstraction and transcription of the raw data from the tapes and field notes. Data reduction involves the process of selecting, focusing, simplifying and coding in order to sharpen, sort, focus, discard and organise the primary data in such a way that the concluding outcome will be easily arrived at and also verified (Miles and Hurbeman 1994). It can be called data condensation. As part of the data reduction, the contents of the transcripts were read, key issues were identified and subsequently coded, after which themes were extracted from the data. The extracted themes were further interpreted in order to provide a better understanding of the main issues which served as a basis for addressing and answering the research questions

(Desouza, 2003). The data reduction process also included field notes which contained the researcher's interpretation of events.

With regard to coding the data, two types of coding were employed: Initial and pattern coding. Miles and Huberman (1994) describe coding as analysis stating that codes are tags or labels that are used in assigning units of meaning to inferential or descriptive information compiled during a study.

4.9.2.1 Initial Coding

In the initial coding stage, straightforward categories were employed in order not to destroy the "meaning of the data through intensive coding" (Eisenhardt, 1991). Numerous codes were generated by reading through responses and identifying data that are related without considering the variety of categories. In some cases, a piece of information was assigned several codes and meaningful phrases were identified and assigned as codes as well (Miles and Hurbeman, 1994).

4.9.2.2 Pattern Coding

The use of pattern coding involves the grouping of summaries into smaller sets of themes and categories (Miles and Huberman, 1994). The codes that were generated during the initial coding stage of the data analysis were re-examined. The ideas that were mentioned repeatedly by the respondents were now grouped into categories. Key themes that were common and found to be recurring or key words or phrases that inferred themes or patterns were then selected. This process assisted in identifying the themes that were related to each research question. It also assisted in reducing the large volume of data into smaller analytical units and identified networks that connected the various components of all the data coded.

4.9.3 Data Display

This is the second step in the data analysis process whereby the already coded data were packaged and displayed so as to enable the researcher to begin to draw conclusions. The display of the data assisted in understanding what was happening and deciding whether or not to further analyse the data. Data display is an organised, compressed assembly of information that permits conclusion drawing and action (Miles and Huberman, 1994). Displays are major avenues to a valid qualitative analysis. They include many types of matrices, graphs, charts and networks, all of which are designed to assemble organised information into an immediately accessible, compact form so that the analyst can see what

is happening and either draw justified conclusions or move on to the next step of analysis. For this research, the codes were displayed in tables and charts. Conclusions were drawn from the themes and categories that were generated at the initial coding stage.

4.9.4 Conclusion Drawing and Verification

This is the third stream of data analysis. Conclusion drawing and verification is the final analytical activity for the qualitative researcher (Miles and Huberman, 1994). This stage was done by examining the patterns and regularities discovered and further explaining these in the light of the flows and propositions already established. This stage of data analysis was undertaken, bearing in mind that the themes identified and discussed in the course of the analysis performed the duty of answering the research questions thereby realising the objectives set out for this research.

4.9.4 Hand coding

For this research, the use of data analysis software was considered at the initial stage however the idea was later discarded based on the fact that computer programs cannot analyse the temporal sequence in the data and cannot understand the implied meanings which depend on events in the background (Denscombe, 2007). According to Ghani (2009), one way of handling rich qualitative data is by coding or sorting data according to concepts and themes. However, coding can be done manually or by utilising specialised qualitative software such as NVivo. Although the researcher could be challenged that template analysis is little different from the use of software packages such as NVivo for the analysis of data and in fact the software might allow a more comprehensive approach; however, Waring and Wainwright (2008) argue that immersion in the data is an essential part of the interpretive process and that the use of technology can often act as a substantial barrier.

According to Denscombe (2007), the computer programs in this respect are only extending and exaggerating a potential hazard facing any procedure which seeks to analyse the data through a systematic ‘chunking’ and coding. This because software packages do this more quickly and more extensively and hence, are potentially more dangerous (Denscombe, 2007). Hesse-Biber and Leavy (2006) note that the challenge for qualitative researchers is how to merge abundant data.

NVivo helps researchers manage, store and analyse large quantities of data (Bazeley and Richards, 2000), as data can be coded into nodes, and it is a useful tool to link the data to

emerging concepts and themes and to develop the overall conclusion of the study. However, according to Morse et al. (2002), it does not replace the researcher's role in analysing and interpreting qualitative data. Besides, a word processor has common functions such as "find", "copy" and "paste" that are practical for searching for certain words, phrases and occurrences in the transcript. This is not only to assist coding but also allows for frequency count analysis. The researcher retains control of the analytical process through manual or hand coding and this assists conceptualisation of the themes. Morse and Richards (2002) affirm that "It is the researcher who makes all the analytic decisions not the data, not the method not the computer. It is the researcher who makes necessary data to produce a rich study and ensures meticulous documentation. It is the researcher who incisively interrogates the data and accurately recognises clues and interprets the findings."

4.10 An Evaluation of the Credibility of the Research

It is important to evaluate the quality of data interpretation by examining the reliability and validity of the research findings. Whatever research methodology is adopted for a research, reliability and validity issues have to be considered as they are tests of the trustworthiness of the measurement instruments used in research (Golafshani, 2003). Validity and reliability are also regarded as concepts central to the credibility of a research (Miles and Huberman, 1994), while, according to Saunders et al. (2009), they reduce the possibility of obtaining a wrong answer. A research study is reliable if consistent results are obtained by different researchers undertaking the study under the same conditions.

4.10.1 Validity

Validity is concerned with whether the measure used is actually measuring the concepts it is supposed to be measuring (Hardy and Bryman, 2004).Validation involves taking the research findings back to the participants and determining whether or not those findings conform to the experiences of the participants (Silverman, 2001). The researcher ensured that after every interview, data were transcribed and given back to each participant to review in order to ensure validity. Stake (1995) emphasises that a good, qualitative study must always have the data collected, validated and it is one of the ethical obligations of the researcher to minimise any misrepresentation and misunderstanding. According to Voss et al. (2002), the issue of validity is whether findings can be generalised beyond the immediate case study.

Wainer and Braun (1988) describe validity in quantitative research as “construct validity”. The construct is the initial concept, notion, question or hypothesis that determines which data are to be gathered and how they are to be gathered. Wainer and Braun (1988) also assert that quantitative researchers actively cause or affect the interplay between construct and data in order to validate their investigation, usually by the application of a test or other process. In this sense, the involvement of the researchers in the research process would greatly reduce the validity of a test. However, Maxwell (2005) identifies two issues in qualitative studies that can impact on validity. The first is ‘researcher bias’ and the other is ‘reactivity’. Researcher bias occurs when a researcher selects data that fits the researcher’s existing theory, while, reactivity is concerned with the influence of the researcher on the setting or people studied and it is a problem often raised about qualitative studies. However, Lubbe (2003) stresses that it is naive to assert that any form of research, or perhaps human activity generally, is without bias. Even in the physical and life sciences, bias is reflected in the subject researched, the experiments chosen, as well as the way the experiment is conducted. Thus bias cannot be totally eliminated but should be recognised and its implications acknowledged and accepted (i.e. lived with). According to Lubbe (2003), bias is everywhere but can be minimised. It is the primary function of the researcher to minimise the level of bias in which he or she is working. Approaches used to counteract biases in this research include:

- Considering SMEs from different sectors rather than concentrating on one particular sector.
- Probing for further explanation when faced with inconsistencies in the interview.
- Using multiple case studies to develop stronger evidence rather than a single case.
- Using literature to back up the research findings.

The use of multiple sources of evidence also substantially assisted in improving the reliability of the research.

4.10.2 Reliability

Although the term ‘reliability’ is a concept used for testing or evaluating quantitative research, the idea is most often used in all kinds of research. Reliability refers to consistency where the characteristics include that of the instrument and the conditions under which it is administered (Cooper and Schindler, 2001). Reliability focuses on whether the process of the study is consistent and reasonably stable over time and across researchers and methods (Miles and Huberman, 1994). Thus, reliability is the extent to

which a questionnaire and an interview produce similar results within a constant environment on all occasions (Bell, 1993). It is essential that the information give trustworthy and stable results in order to be reliable. Yin (2009) further states that reliability means to allow the study to be repeated in the same way and yielding the same results. Nevertheless, Merriam (1998) advocates that reliability is problematic in social sciences simply because human behaviour is never static. The problem of reliability in qualitative research is that differences between replicated studies using different researchers are to be expected. Similarly, Myer (2001) states that it may not be surprising that many researchers generate different findings and reach different conclusions. Nevertheless, controlling for reliability may still be relevant.

To ensure reliability in qualitative research, examination of trustworthiness is crucial (Seale, 1999). In contrast, Stenbacka (2001) argues that since the reliability issue concerns measurements then it has no relevance in qualitative research. Stenbacka (2001) adds that the issue of reliability is an irrelevant matter in the judgement of quality in qualitative research. However, Lincoln and Guba (1985) state that: "Since there can be no validity without reliability, a demonstration of the former (validity) is sufficient to establish the latter (reliability)". Patton (2001) agrees that reliability is a consequence of the validity in a study.

Reliability was strengthened in this research in several ways. First, the questionnaire and the interview guide were pre-tested (pilot study) (Silverman, 2001). Pre-testing involved carrying out a pilot study with two SMEs in Lagos prior to the main data collection period. Furthermore, in order to minimise inferences, all interviews were recorded and transcribed. According to Peräkylä (2004), the 'quality' of the recordings and the interview transcripts are important when the aim is to establish the reliability of research findings stemming from social interaction. Also, the use of a case study protocol was another strategy. Lubbe (2003) indicates that using a protocol is a primary tactic in increasing the reliability of the case study.

4.10.3 Triangulation

Triangulation is typically a strategy for improving the validity and reliability of a research or evaluation of findings (Golafshani, 2003). Patton (2001) advocates that the use of triangulation strengthens a study by combining methods. Triangulation refers to the use of more than one approach for the investigation of a research question in order to enhance confidence in the ensuing findings (Bryman, 2006). According to Webb et al. (1996),

"Once a proposition has been confirmed by two or more independent measurement processes, the uncertainty of its interpretation is greatly reduced. The most persuasive evidence comes through a triangulation of measurement processes". Thus, it might be used to refer to multi method research in which a quantitative and a qualitative research method are combined to provide a more complete set of findings than could be arrived at through the administration of one of the methods alone. Triangulation is a device for enhancing the credibility and persuasiveness of a research account (Bryman, 2006). Triangulation is also known as convergent methodology (Creswell, 2002) as illustrated by figure 4.2.

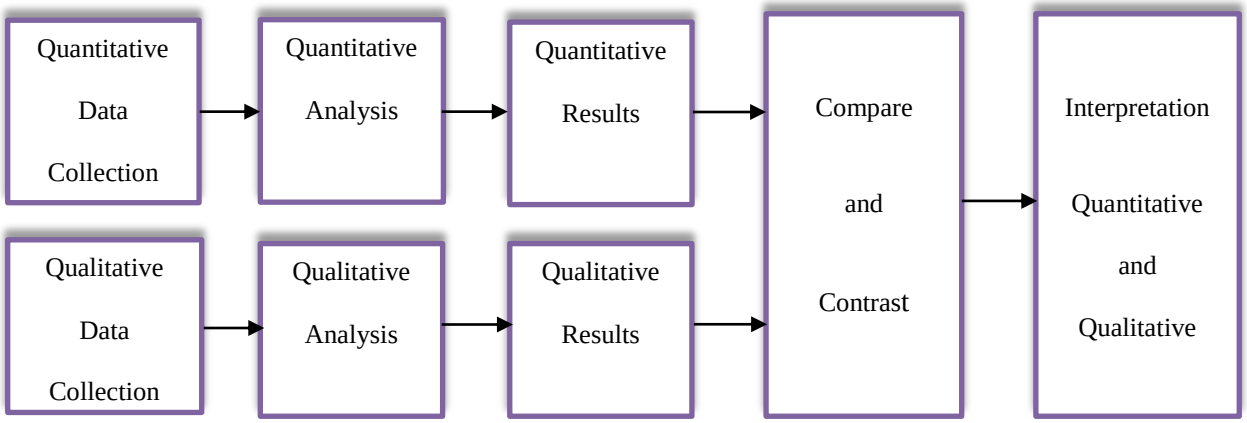

Figure 4.2: Triangulation – Convergence Model (Creswell, 2002)

It has been argued in IS research, that combining qualitative and quantitative research methods can be useful in building a wider picture of a phenomenon under study (Reichardt and Cook, 1989). IS research is described by Becker and Björn (2007) as a rich tapestry of diverse research methods, paradigms and approaches that are multi-disciplinary and multi-national. Zawedde et al. (2010) advocate that research in IS is a multi-activity process that may require different research approaches. The use of various methods for data collection in this research, assisted in addressing the potential drawbacks of individual methods by exploiting the strengths of each method at various stages of the research. Furthermore, analysis of the epistemological assumptions for each of the methods is essential, not only to establish the appropriateness of use of a method in a phase of research but also the compatibility of methods to be used together as stated by Zawedde et al. (2010). These authors further stated that the strength of methodological triangulation depends on how well the epistemological characteristics of the research methods are matched.

Also, Munro and Mingers (2002) and Becker and Björn (2007) note that there is increasing use of interpretivism to enable capturing of social factors that are key in IS development. Triangulating the methodologies based on the interpretivist paradigm with those based on the positivist paradigm can therefore improve the social responsiveness of IS research (Zawedde et al., 2010) as is the case in this research.

4.10.4 Generalisation

Generalisation can also be used to establish the quality of empirical social research. This is the degree to which findings are generalisable to different people, settings or times. Positivist research seeks high generalisability. It is concerned with searching for general laws or patterns rather than findings that are unique to one particular case (Oates, 2006) and can also be referred to as "external validity". Generalisation can only be performed if the case study design has been appropriately informed by theory, and can therefore be seen to add to the established theory. The method of generalisation for case studies is not statistical generalisation but analytical generalisation. In other words, a complete presentation of the results or a previously developed theory is used as a template to compare the empirical results of the case study (Yin, 2009). Yin (2009) further states that if two or more cases are shown to support the same theory, replication can be claimed whereas, in analytical generalisation, each case is viewed as an experiment, and not a case within an experiment.

Yin (2003) states that the greater the number of case studies that show replication, the greater the rigour with which a theory has been established. Yin (2003) further notes that case studies are generalisable to theoretical propositions, not to populations as in survey research. A case study has lower generalisation ability, whereas a survey study can provide higher generalisation. The results of this research are valid for SMEs in Nigeria, in terms of generalisation. This is because Nigerian SMEs are homogeneous, i.e. they share common characteristics; therefore, what is applicable to SMEs in Lagos could be applied elsewhere. However, Yin (2003) argues that generalisations involving other SMEs in other countries can be made but suggests that they should be made with caution.

In addition, internal validity is also used in case study research. It is a matter of establishing causal relationships. This implies that a research should be able to explain how certain conditions lead to other conditions, such as how does A influence B (Yin, 2003). In this research, pattern matching and explanation building was used to ensure internal validity. Pattern matching is possible when multiple cases are included in the analysis.

Tellis (1997) describes "pattern-matching" as a useful technique for linking data to the propositions. Tellis (1997) also asserts that pattern-matching is a situation where several pieces of information from the same case may be related to some theoretical proposition. It allows the comparison of different perspectives of respondents regarding the same research phenomenon. In this research**,** after the pattern matching phase, findings from the different cases were combined to form an overall explanation regarding the research topic. Also, the role of the researcher was examined with respect to evaluating the credibility of the research.

4.10.5 Role of Researcher

The role of the researcher is vital in achieving credible research outcomes. Janesick (1994) affirms that it is important for the researcher to describe his/her role thoroughly as it enables the reader to understand the relationship between the researcher and the research. According to Ghauri and Grønhaug (2002), to ensure validity, the researcher is required to understand received information during interviews, be a good listener and understand what is meant by what is said. For this research, a semi-structured interview schedule was prepared in advance of the interviews which helped the researcher to control the situation, ask the right questions, adapt to new or unexpected situations and develop trust (Ghauri and Grønhaug, 2002). Easterby-Smith et al. (1991) stress that using appropriate language helps to develop trust. The researcher ensured that the English Language was used, which is a language familiar to all the participants. Furthermore, Easterby-Smith et al. (1991) state that interview bias is a concern as the interviewer can impose their own reference frame on the interviewees, both when questions are asked and as the answers are interpreted. However, the use of open ended questions in this study assisted in avoiding bias during the interviews. Also, the researcher ensured that supporting probes to clarify points were used whenever necessary. Likewise, ethical issues were considered since the research was dealing with humans.

4.10.6 Ethical Consideration

In terms of ethical consideration, Oliver (2003) advises that all situations dealing with humans should be treated with respect, they should not be harmed in any way and should be fully informed about what is being done with the information. Before the interviews, all the interviewees were requested to sign a declaration form indicating their interest in participating in the research. Saunders et al. (2006) describe ethics in the context of research as the appropriateness of behaviour in relation to the rights of those who become

subject to your work. Besides, the University of Wolverhampton has an ethical validation process which ensures that researchers conform to a reasonably accepted standard. The ethical code of the University ensures that there is no interference with participants' physical and psychological well-being, the research procedure is not likely to be stressful or distressing, the research materials are not sensitive, discriminatory or inappropriate, the research design is sufficiently well-grounded so that the potential participants' time is not wasted during the data collection; the research instruments used for this study were subjected to the requirements of the University's ethical research committee. Having addressed and satisfied all the criteria, the ethics committee granted permission for the field work to commence. A letter of consent was obtained from the researcher's department and was presented to each participant, outlining the aim of the research and emphasising that information provided would remain strictly confidential and be used only for the purpose of the research. Hence, the participants were reassured that the data gathered will be treated in a manner that will protect the confidentiality and anonymity of the companies involved in the study. All the interviews commenced only after each participant agreed to participate.

4.11 Overview of the Entire Research Process

From the foregoing discussion the diagram below (i.e. figure 4.3) presents the entire research process for this study showing the various steps involved in carrying out the research.

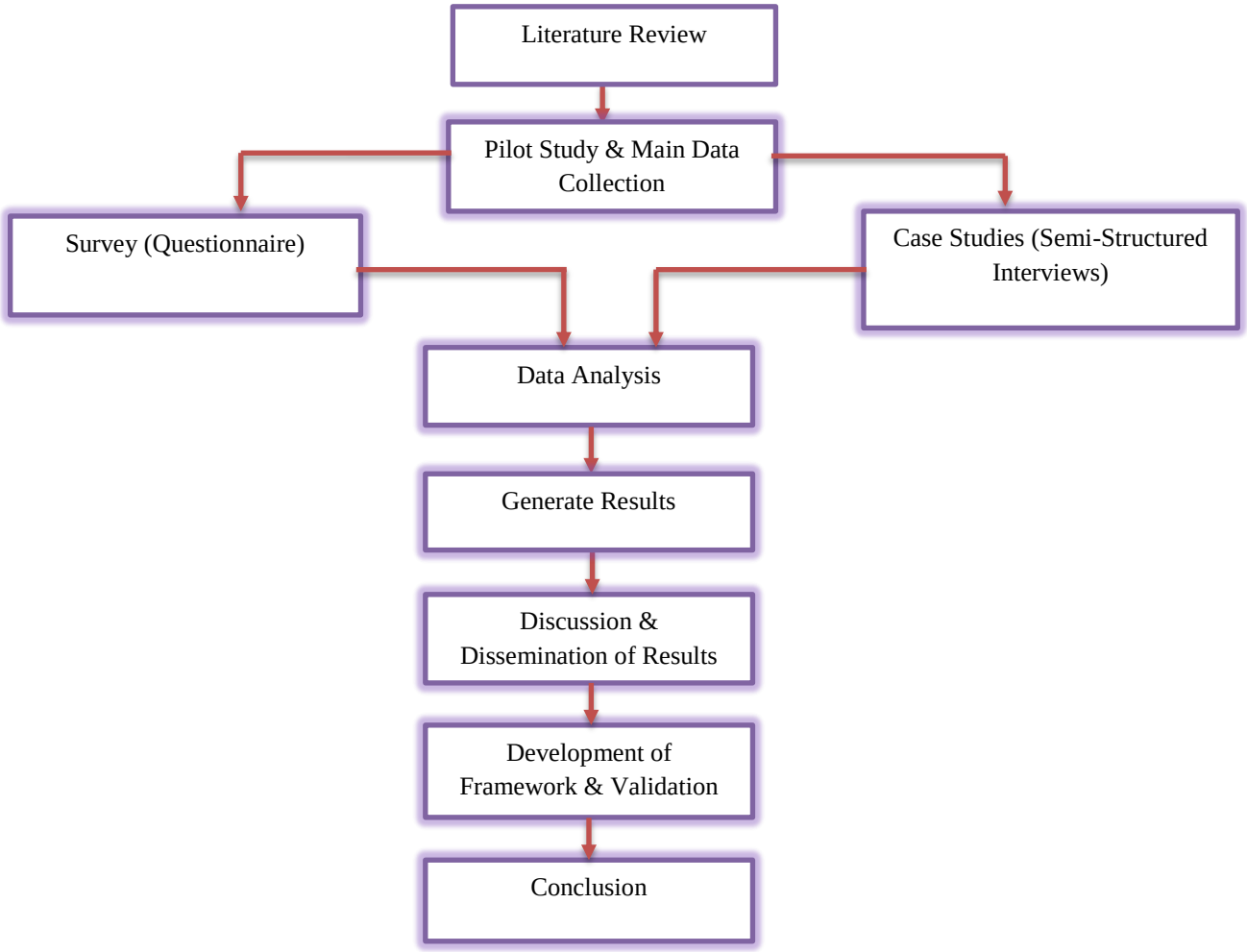

Figure 4.3: Research process

4.12 Summary

This chapter has outlined the methodology and research design employed in this research. The establishment of a robust research methodology was the primary focus of this chapter. The research combined both quantitative and qualitative research methods with a greater dominance on the qualitative method. There was an in-depth explanation of the research method used for the purpose of this research and a justification for the choice of the qualitative research mode. Also, the chapter has identified the various data sources that were used in the research. The choice of the research strategy was based on the nature of

the data. A survey was used in the first phase of the research while in the second phase, interviews, observations and documents were used to complement the results of the survey. This chapter also discussed the approaches adopted in the research as well as the criteria employed for selecting the cases. The selected companies represented a broad range of industries. Furthermore, the rationale for the choice of Lagos State as the setting for this research was highlighted. Also, ethical concerns with regard to data collection were emphasised as well as the method of data analysis, highlighting the various steps that were involved.

CHAPTER FIVE – DATA ANALYSIS

5.0 Introduction

This chapter presents the findings of the research based on simple statistical analysis of data obtained from the survey conducted in the first phase of the research. The chapter also presents the findings of a qualitative study obtained in the second phase of the research. This study is comprised of seven SMEs that participated in the survey (first phase) which were identified as adopters/users of ICT and further selected as cases for the purpose of this research. In the first phase a questionnaire was designed, based on the review of current literature, to assist in identifying SMEs that have successfully adopted ICT, as well as SMEs that were non-adopters of ICT within the region chosen for the research. The non-adopters of ICT were given the opportunity to provide reasons for their decisions. The current adopters/users of ICT were requested to specify various types of technologies that are currently in use in their different organisations, as a means of measuring the level of utilisation of sophisticated/advanced ICT systems in the SMEs. The questionnaire further assisted in identifying SMEs that were to be used as case studies.

5.1 Survey Analysis

A total of 200 questionnaires were distributed to SMEs across the region as indicated in Chapter four. In total, 105 completed questionnaires were returned representing a 52.5% response rate. Of these 39 (37.1%) were either not filled in or had some missing key information and 66 (62.9%) were fully completed. Therefore, for this research the total number of companies considered will be 66. Reasons for the partially completed questionnaires were either due to company policy or in some situations companies were reluctant to complete the questionnaire for reasons of data protection. Data from the questionnaires were analysed using content analysis and descriptive statistics. A number of tables and charts were constructed to reflect basic details of the dataset. A wide range of responses was generated from the questionnaires which were collated manually to provide an initial view of ICT presence in the participating SMEs.

5.1.1 Position in Company

The first section of the questionnaire provided brief background information of the responding companies. This was presented first, to put the data within a meaningful context. Respondents came from a wide variety of backgrounds and the majority held

managerial roles, such as business owners/managers, general managers, managing directors and chief executive officers. The others were either IT professionals or heads of departments, supervisors, chief accountants, secretaries and so on. Table 5.1 and figure 5.1 provide an overview of the respondents that participated in the survey and fully completed the questionnaire. The result shows that the majority of the respondents who completed the questionnaire were in managerial roles in their companies.

Table 5.1: Position in Company

Position	**Number***	**Percentage (%)**
Manager/General Manager	36	55
Director/Managing Director	14	21
IT Officer/Head of Department	3	4
Chief Executive Officer	6	9
Others	7	11

*N = 66 (Total number of companies that fully completed the questionnaire).

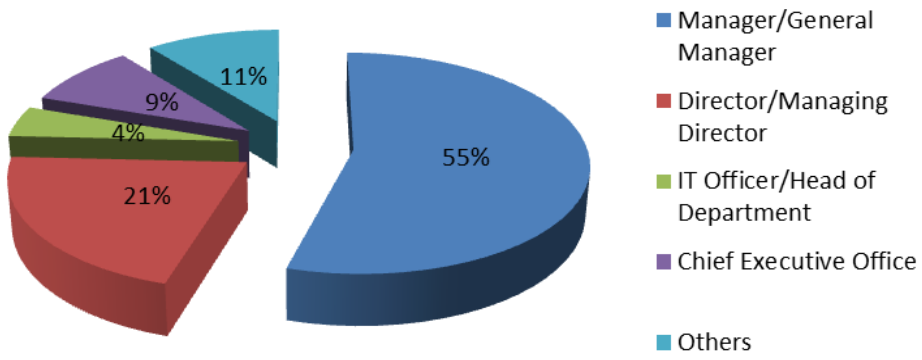

Figure 5.1: Position in Company

5.1.2 Size of SMEs

In the first section of the questionnaire the number of employees in each of the participating SMEs was identified and further classified based on their size, using the definition of SMEs in Nigeria as defined by SMEDAN (2005). Of the 66 SMEs that fully completed the questionnaire, 88% were classified as small enterprises (between 10 and 49 employees) and 12% medium enterprises (between 50 and 199 employees) as shown in Table 5.2.

Table 5.2: Size of SMEs

Size	Number	Percentage (%)
11-49 employees	58	88
50-199 employees	8	12

5.1.3 Average Levels of Education

Respondents were requested to indicate the average level of education amongst their employees. Of the 66 questionnaires that were fully completed, it was observed that employees who had masters' degrees were all in managerial positions. It was also identified that one of the managers had a PhD. However, it is important to note that the majority of the respondents selected at least more than one option in the questionnaire; for example, technical college and bachelor's degree and so on. Table 5.3 and figure 5.2 provide information on the average level of education amongst employees in the participating companies.

Table 5.3: Levels of Education

Levels of Education	Number	Percentage (%)
Primary School	3	5
Secondary School	28	42.4
Technical College	33	50
Bachelor's Degree	32	48.5
Master's Degree	5	7.5
Doctoral Degree	1	1.5

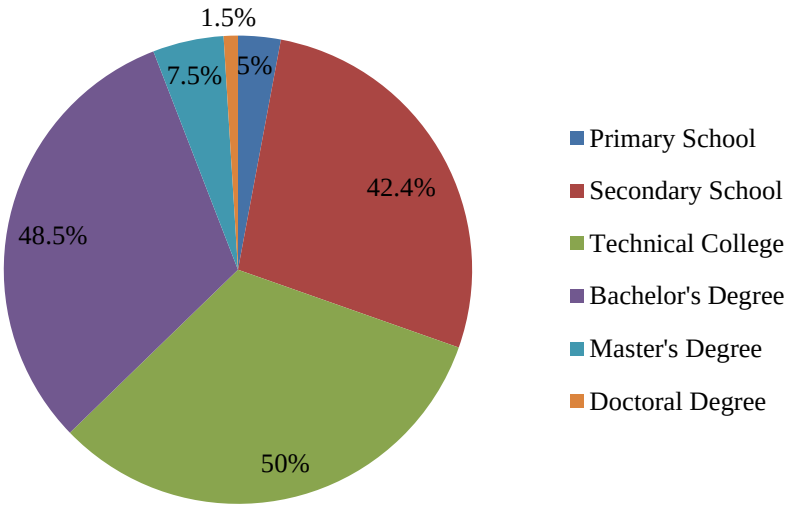

Figure 5.2: Levels of Education

5.1.4 Industry (Sectors) of Participants

The results show that respondents who completed the questionnaires emerged from a large number of industry or sectors. Table 5.4 and figure 5.3 provide details of the different sectors of SMEs that participated in the survey.

Table 5.4: Industry/Sectors of Participants

Industry (sector) of Participants (SMEs)	Number	Percentage (%)
Engineering	4	6
Hospitality/Grocery/Food Processing	8	12.1
Financial Service/Stockbroking/Risk Management	7	10.6
Wholesale/Retail	6	9
Construction/Real Estate	1	1.5
Medical/Pharmaceutical	2	3
Telecommunications/Communication	4	6
Oil and Gas	9	14
Education	1	1.5
Legal Practice	1	1.5
Manufacturing	8	12.1
Transport/Haulage/Freight	11	16.6
others	4	6

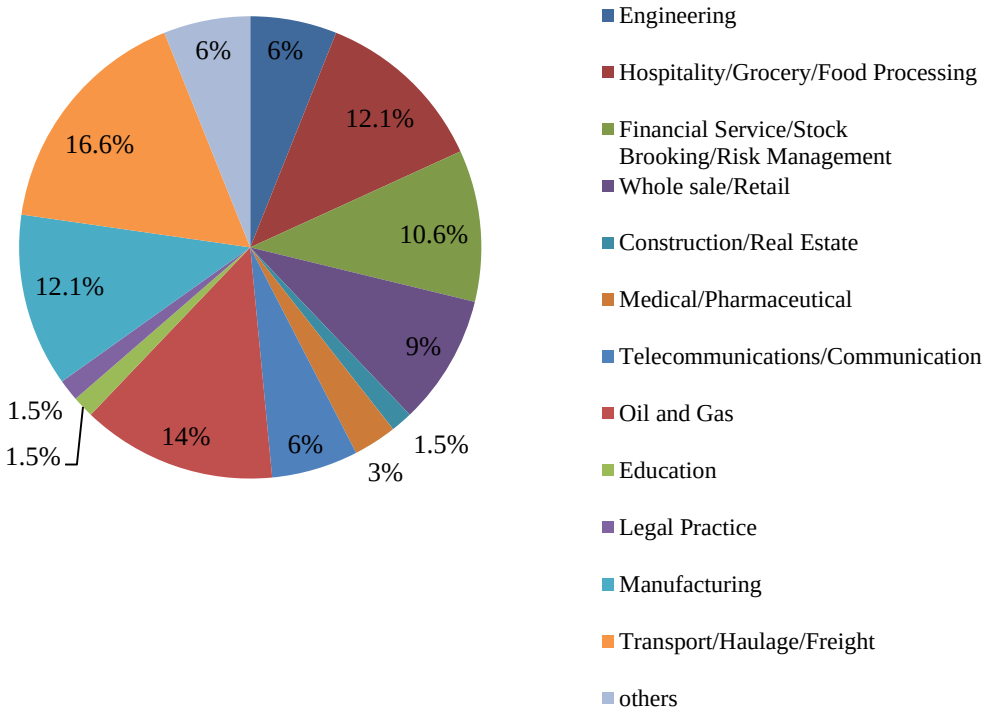

Figure 5.3: Industry/Sectors of Participants

6% of the firms were identified as engineering firms; also, 6% were identified as telecommunications/communication companies as well as firms from a combination of other sectors. The largest numbers of SMEs that participated in the study were those of transport/haulage/freight companies having 16.6% which probably results from the inclusion of firms around the Apapa sea port (the largest sea port in Nigeria) in the study.

5.1.5 Number of ICT Users

Respondents were asked to indicate whether or not they were ICT users by simply selecting a "yes" or "no" answer. Of the 66 SMEs that fully completed the questionnaire, 43 (65%) were ICT adopters/users and the remaining 23 (35%) were non-adopters/non-users of ICT. This result shows in table 5.5 and also in figure 5.4 that the majority of the SMEs in the region are adopters of ICT.

Table 5.5: Number of ICT Users

ICT Users	Numbers	Percentage (%)
Yes	43	65
No	23	35

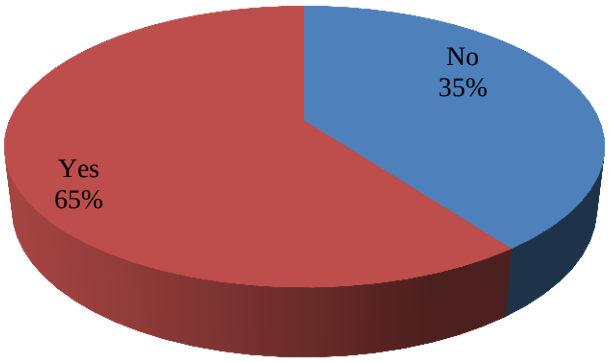

Figure 5.4: ICT users/non-users

5.1.6 Number of Computers in Companies

32% of SMEs had between one and five computers (such as desktop and laptops) while 13.5% had between six and 10 computers. Twenty-three SMEs were identified in the study

as non-users of ICT which represented 35% and is indicated as “none” in table 5.6, which provides full details of the number of computers in the companies.

Table 5.6: Number of computers in companies

Number of Computers	Number of SMEs	Percentage (%)
1-5	21	32
6-10	9	13.5
11-15	3	4.5
16-20	2	3
21-25	3	4.5
26-30	3	4.5
31-35	0	0
36-40	1	2
41-45	0	0
46-50	1	1.5
None	23	35

5.1.7 Types of ICT Applications in SMEs

Of the surveyed SMEs, 13.6% use only software applications while 7.5% of the SMEs mainly use communication applications. Furthermore, 42% of the respondents indicated they have both software and communication applications in place. One SME did not indicate the type of technology that was in place in their company. The statistics in table 5.7 suggest that more than half of the SMEs in the study have some form of ICT applications or solutions.

Examples of software present in these firms include: Primera for disc publishing or duplicating CDs and DVDs, Symbols which is used to type documents in any language, Peach tree accounting software, Vessel Tracker, Business Soft, ERP, Microsoft Package, Data Management Software (DMS) and AutoCad. Communication applications that are presently used mainly include mobile phones with no internet connection, telephone and fax, broadband for internet service and a few had intranet and LAN (Local Area Network). In addition, one company indicated that they have a computer but did not specify other types of applications they had in place. Furthermore, three SMEs indicated that internet and intranet services were currently being used in their companies. However, none of the SMEs had extranet or WAN (Wide Area Network), neither did any SME indicate the use of video conferencing in their company.

Meanwhile, it was identified that the majority of the SMEs that participated in the survey use mainly standard office applications and in some cases the internet which are regarded as basic or traditional computer-based technologies. Only a few of the SMEs use ERP, DMS, accounting packages and so on. Basic or traditional ICTs are regarded as those packages that can be used on a personal computer at home or at work. They include word processing (for writing letters); spreadsheets (for calculations and to analyse financial information); presentation software (to make presentations either using a computer screen or data projector); desk top publishing (to produce newsletters, magazines and other complex documents); and, graphics software (for creating and editing images such as logos), amongst others. The results of the survey indicate that the market is dominated by Microsoft based personal computers (PCs).

The sophisticated or advanced technologies, which can also be called specialist applications, are the more recent and fast growing range of digital communication technologies that allow people and organisations to communicate and share information digitally. These sophisticated ICTs include accounting packages (e.g. Peachtree that helps to manage an organisation's accounts, revenues/sales, purchases, bank accounts and so on). Also, there are other sophisticated ICT applications that can be used in SMEs. These include, Computer Aided Design (CAD), which can be used for architectural and engineering design, Customer Relationship Management (CRM) software that helps businesses to understand their customers as it helps these businesses to collect and analyse data such as product preferences, buying habits and so on. Other sophisticated technologies include ERP and Data Management Systems (DMS). ERP helps in terms of planning and control, scheduling and resource allocation of projects, forecasting and so on, whereas DMS helps organisations to keep track of large quantities of documents as it offers easy access to filing systems. In some SMEs, the only sophisticated ICT solution that was identified is the internet. Again, in this research the internet is classified as a basic ICT since internet service is expected to be present in every workplace and can be used on a personal computer either at home or at work. Furthermore, it was observed that only a few SMEs use ERP, DMS, LAN (Local Area Network), intranet and so on. It was surprising that none of the SMEs currently use PDAs, WAN (Wide Area Network) or extranet.

Table 5.7: Types of ICT applications in SMEs

Types of ICT Applications	Number of SMEs	Percentage
Software Applications	9	13.6
Communication Applications	5	7.5
Software and Communication Applications	28	42
None	23	34.8
*Missing data	1	1.5

*Note: The missing data represents one company which indicated they had computers but did not specify the types of applications they had in place.

5.1.8 SMEs Dependence on ICT

Although seven SMEs indicated that their businesses could function without the use of ICT, four of them were earlier identified to be ICT users and to have some type of technology in place. For example, two transport companies indicated that they use ICT and both had between 1-5 computers respectively in their organisation. Furthermore, both companies had internet service but were of the opinion that their businesses could still function successfully without depending on ICT. A financial service company with 11-15 computers that uses some software but has no internet service also had a similar opinion. Finally, a sales company with 28 computers and equipped with some types of software and internet access was also identified to be non-ICT reliant. In addition, 20 of the SMEs made no indication whether or not their businesses relied on ICT, since they had no form of technology in place. In summary, they were all convinced that their businesses could flourish or function effectively without any form of ICT.

Twenty SMEs in the survey did not to respond to this question as shown in table 5.8. However, it was observed that most of the SMEs that did not respond to the above question were those companies that had no form of ICT in place. Interestingly, a maritime company accepted that their business was currently not ICT reliant; however, they indicated that their business needed ICT for growth but due to financial constraints they could not afford to acquire it.

Table 5.8: SMEs' Dependence on ICT

SMEs' Dependence on ICT	Number of SMEs	Percentage (%)
Yes	39	59
No	7	11
None of the above	20	30

5.1.9 Reasons for SMEs' non-adoption of ICT

The questionnaire also sought to identify reasons for non-adoption of ICT amongst responding SMEs. Respondents who had not adopted ICT were requested to give reasons behind their non-adoption. Of the 23 SMEs, 22 gave several reasons for their inability to adopt any form of ICT as listed in table 5.9. There were 14 issues identified as reasons behind the non-adoption of ICT amongst the entire SMEs; however, it was observed that issues relating to cost was not the main reason for non-adoption rather, many SMEs indicated that lack of electricity and lack of skills were the major factors behind their non-adoption of ICT.

Table 5.9: Reasons for SMEs' non-adoption of ICT

Rank	Reasons for non-adoption	Number of SMEs	Percentage (%)
1.	Lack of Power	11	48
2.	Lack of Skills	10	44
3.	Lack of Knowledge	7	30
4.	Training Cost	6	26
5.	Investment Cost	5	22
6.	Maintenance Cost	4	17
7.	Lack of Awareness	3	13
8.	ISP Providers	3	13
9.	Lack of Support from Banks	2	9
10.	Governmental Policies	2	9
11.	Bank Regulations	2	9
12.	Corruption	2	9
13.	Tax	2	9
14.	Fraud	1	4

5.1.10 Number of Computer Literate Staff in Participating Companies

Respondents were asked if their employees were computer literate and were further requested to specify what proportion could be identified as computer literate. The result is given by Table 5.10.

Table 5.10: Number of computer literate staff in SMEs

Number of Computer Literate Staff	Number of SMEs	Percentage
Majority	30	45
Minority	10	15
A few	4	6
None	14	21
No response	7	11
Manager	1	2

6% indicated that few of their employees were computer literate, 21% indicated that none of their employees was computer literate, 11% did not specify whether or not their employees were computer literate and 1 SME (2%) indicated that only the manager was computer literate. Having presented the results obtained from the survey data analysis, the next section presents the results of the qualitative data analysis as well as background information on the selected case study organisations.

5.2 Qualitative Data Analysis (Report on Cases)

This section presents findings of the qualitative study (second phase) amongst seven SMEs that participated in the survey (first phase) which were identified as adopters/users of ICT and further selected as cases for the purpose of this research. The experiences of the selected SMEs with respect to their adoption and utilisation of ICT in their individual companies are presented. Information and Communication Technologies include products and services such as desktop computers, laptops, internet, intranet, business productivity software, servers, satellites, and so on. The main tool used for data collection in this second phase was semi-structured interviews which were conducted with owner-managers, managing directors, heads or managers of departments, IT professionals, secretaries, and some other administrative staff.

The semi-structured interviews were used in conjunction with the questionnaire to aid better interpretation of results. The interviews created an avenue for the interviewer to ask for further clarification of certain issues and assisted in gathering additional information that were not captured by the survey. For example, where participants were asked to list the types of ICT applications in their various SMEs, they identified just a few. However, during the interviews more of these ICT applications were identified by respondents.

The case studies assisted in providing in-depth understanding of fundamental issues pertaining to the research. The researcher also made use of documents such as company reports in addition to observations, thereby assisting in providing better information.

5.2.1. Overview of Case Study Participants

Of the 66 SMEs that fully completed the questionnaire in the survey phase, 30 SMEs that had adopted ICT were approached to participate in this second phase (case study). The criteria for inclusion were based on the need for each participating company to conform to the definition of SMEs in Nigeria and a willingness on the part of the SME participants to disclose details of their businesses. Five potential SMEs were rejected as they were not willing to disclose details regarding their business. However, semi-structured interviews were then conducted with the remaining 25 SMEs, which comprised SMEs across a wide range of business sectors. Seven SMEs were finally selected on the basis of their size, post ICT adoption experience and also based on other criteria (e.g. turnover) that were highlighted in Chapter 4. The primary details of the SMEs that were finally selected as cases for the purpose of this research are described in table 5.11.

Table 5.11: Case study SMEs

SMEs	Type of Business	Number of Employees	Year of Establishment	Annual Turnover
A	Wholesale/Retail	90 (Medium)	2001	₦62m
B	Hospitality	40 (small)	2005	₦33m
C	Engineering/Marketing	43 (Small)	1998	₦38m
D	Telecommunication/Communication	15 (Small)	2007	₦23m
E	Transport/Haulage/Freight	19 (Small)	2001	₦36.7m
F	Manufacturing	80 (Medium)	2000	₦56m
G	Financial Service/Stockbroking	25 (Small)	2006	₦17m

5.2.2 Company Background

For the purpose of anonymity the names of the cases have been disguised as CsA, CsB, CsC, CsD, CsE, CsF and CsG.

5.2.2.1 Case Study A (CsA)

CsA is a retail company that was established in March 2001 and is mainly engaged in the sale of electronics. Initially, the company was involved in the importation of foodstuffs and

slowly moved on to the electronics business. Since 2005, CsA has been dealing mainly with LG products and has an annual turnover of ₦62m. CsA is a medium-sized company with its headquarters located in Lagos. The company also has branches in Abuja and Port-Harcourt and currently has 90 employees, including truck drivers. The majority of the company's management are from one family; hence the company maintains a close management system with almost every member of the family playing a key role. CsA has a sales, administrative, technical and workshop, account and IT departments each with a departmental manager. The company's mission is to become a leading electronics retailer that employs modern technologies in order to satisfy customers and facilitate change in the electronics retail market in Nigeria. CsA's objectives are to sell and provide different products to different customers from high to low income earners, to build good relationships with customers and suppliers, to satisfy customers at minimum cost and to use modern ICT systems to provide tailored services to customers. Currently CsA utilises some ICT applications such as ERP software architecture for planning. This software also provides the management with a comprehensive overview of the company's business executions which helps in decision making, thereby assisting in streamlining different organisational processes and workflows. Likewise, the company uses its intranet for sharing vital information among branches and departments and network servers for internet connection. The decision to adopt ICT was made by the managing director and in 2008 the company decided to create its website.

5.2.2.2 Case Study B (CsB)

CsB is a hotel which was established in 2005. It has a total of 40 full-time and part-time workers with an annual turnover of ₦33m excluding tax. There are 47 rooms in the hotel, and the company also has a cyber cafe. The business started as a micro business centre (cyber café) and then grew to a small business establishment. CsB has a manager who is also the owner and oversees the day-to-day running of the hotel. CsB has different departments: restaurant and bar, admin, accounts, audit, housekeeping and the IT department that manages the cyber café. The hotel's mission is to provide quality service for its guests with the support of integrated ICT systems. CsB's objectives are to provide a conducive environment for people to live in and to ensure guests are satisfied. The hotel has a target of becoming a five star hotel. CsB has a website and intends to carry out an upgrade on all its systems so as to continue to remain ICT compliant as much as possible. It was the owner-manager's decision to adopt ICT in the hotel since the business initially

began as a cyber café. CsB currently uses the Peachtree accounting software for compiling information and updating accounts and a software called Hot Soft for providing effective and efficient services to guests. Hot soft enables the management to have total control over the entire operations in the hotel. CsB utilises ICT applications for auditing as well as the internet for sending emails and general communication. There is also a CCTV in the hotel.

5.2.2.3 Case Study C (CsC)

CsC is a small engineering company located in Lagos which was established in 1998 and has an annual turnover of more than ₦38m. Presently, the company has 43 employees and the company's head office is located in Port-Harcourt. CsC sells and services generators and heavy duty equipment and sometimes does rentals of generators. The company's current organisational structure comprises the branch manager in the Lagos office who is answerable to the managing director, the owner in Port-Harcourt. CsC has sales, admin, technical and workshop, IT and accounts departments, each with a departmental head or manager. Although CsC has an IT department, the company still hires consultants that also help to manage the company's ICT infrastructures. CsC's mission is to have a good reputation as an SME that would assist in further developing the small business sector by providing quality service with the use of modern technological facilities. The company's goal is to have a very large share of the generator market. Nevertheless, CsC has several competitors that are also working very hard to have a large share of the generator market, especially in Lagos. CsC desires to satisfy their customers; hence after a customer purchases a generator, at the completion of 100 hours of the generator's use, CsC offers a free maintenance service. After this a negotiation can be made with the customer to have a servicing contract. CsC also has a culture of delivering generators free to customers after purchase and there is also a warranty for each generator. As a result, within one year or 1,500 hours of use of every generator, if there is a defect, CsC replaces the generator free of charge. The company uses some software which includes an accounting package called Business Soft as well as the Microsoft package. CsC has a website and also uses the internet to communicate with customers and between branches.

5.2.2.4 Case Study D (CsD)

CsD is an authorised telecommunication distribution company which was established in 2007. It is a small company that acts as a distributor for all the major telecom service

providers in Lagos, ranging from MTN, ZAIN, Starcomms, Globacom, Visafone and a host of others. The company is also involved in the sale of telephone handsets such as Nokia, Samsung, Motorola and so on. CsD is a private limited company and has 15 employees with presently a turnover of over ₦23m. The company's mission is to add value to ICT development in Nigeria by the services they provide with the help of modern management practices and the effective utilisation of various ICTs. CsD aims to contribute towards the effective utilisation of ICTs within small industries in Nigeria and help create more employment by helping to get people employed. CsD has a goal of becoming a telecom service provider in the near future and intends to expand their market size with the products and services they offer. The managing director stated that the company's interim objective is to become a sole distributor to telecom service providers in Lagos and that CsD has a target of expanding to the neighbouring States in the near future. The company intends to obtain a regional licence from the government that will enable it to roll out to States in the Southern part of Nigeria. The current business environment of CsD is described as challenging but the managing director states that the challenges in CsD are no different from other SMEs. CsD has a satellite dish and a modem for internet accessibility, laptops and desktop computers for various work stations. Computers are used to keep inventory and to update the company's records. The company also uses some software to monitor their ICT environment for possible security threats. Although CsD currently does not have a website, it has an IT department with staff who are knowledgeable about certain aspects of ICT. Nevertheless, the company describes ICT as being broad hence sometimes the company relies on external consultants to handle their ICT infrastructures. A major reason for utilising ICT in CsD is the nature of the company's business.

5.2.2.5 Case Study E (CsE)

CsE was established in 2001 with the purpose of facilitating trade. CsE is one of the leading freight companies in the shipping business within the region. The company exports goods from Nigeria to other countries and delivers goods that come from abroad to customers. CsE is also involved in farming and deals with farm produce such as cocoa and cotton. All CsE employees are full-time workers and presently the company has 19 employees, with an annual turnover of ₦36.7m. CsE has a company manager and heads of admin, logistics and accounts departments. The company's mission is to use modern technologies to communicate and satisfy clients. CsE aims to make Nigeria a better place for business in terms of shipping of goods. Although the company does not really have a

target market it works hard to stand out from the crowd by providing unique services to their clients. Although the internet and computers are used in the company, there is no sophisticated software installed in the systems except for Microsoft office. The company uses the internet to send emails and uses Microsoft office to carry out other tasks such as writing letters. Furthermore, CsE has a website but does not have an IT department. Whenever there is a technical problem with the company's systems, they employ a consultant. It was the company's secretary who suggested that CsE adopts some form of ICT, such as the internet.

5.2.2.6 Case Study F (CsF)

CsF is a company that manufactures washing detergents, other soap detergents and beverages. It is a medium sized company and has 80 employees. The company's annual turnover is about ₦56m. The organisational structure of the company comprises a managing director, departmental managers of production, administration and transport, marketing, quality control and accounts. The company's mission is to manufacture the highest quality products with the help of modern technologies and maintain maximum customer satisfaction through superior service and competitive pricing. The company goals are to build a brand, to enrich all Nigerians via viable product sales and also to ensure that the quality and standard of the products they manufacture meets up with Nigeria's demand. The company's managing director states that CsF products are unique and have changed over the years in terms of quality and market segmentation. He further states that the present business environment of CsF is above average. The company has several competitors who try to introduce new products every quarter of the year, hence CsF ensures that they also introduce new products that are eye catching to its customers in terms of brands. The company uses the Peachtree accounting software to manage its accounts and also uses Microsoft office. There is also internet connection in the company. Presently, the company does not have a technical department rather CsF has a consultant who manages the company's systems. CsF usually contacts its internet service provider whenever there is a problem with the company's internet connection. CsF does not have a website but intends to create one to enable them to display their products online. At some point it was a departmental manager who suggested the idea of adopting ICT, after attending a training programme on the relevance of information technology.

5.2.2.7 Case Study G (CsG)

CsG is a stockbroking company registered with the Nigerian stock exchange and was established in 2006. It is a small company with 25 employees and an annual turnover of ₦ 17m. CsG offers stockbroking and portfolio management for customers and provides financial advice as well as other financial services to help give customers an account of their investments. CsG's mission is to help customers make investments in stocks with the click of a "mouse" ensuring customers are able to see the exact position of their stocks quickly, with the help of ICT facilities in the company. The company ensures that customers' data are recorded on a system which helps to keep the company's database current and up-to-date. The company's organisational structure comprises the managing director who is also the owner, and a management team comprising of a few heads of departments, plus other staff reporting to the management team. CsG endeavours to give its customers a report for every financial investment and ensure their customers are satisfied. CsG's market has been doing well; however, the managing director states that it has been a bit difficult recently, due to the economic meltdown, i.e. the economic recession, whereby companies are closing up and organisations including the banking sector are laying off staff. The banks are the major investors in the company's market. Notwithstanding, the company's managing director/owner further stated that CsG's business environment is now "picking up again". Although there are several registered stockbroking firms in the country and this is increasing on a daily basis, CsG attempts to stand out in what they do by providing very good customer service as customers' satisfaction is a priority. The main person who initiated the idea of adopting ICT in the company was the managing director/owner. Initially, the company had an ICT consulting firm that was responsible for managing CsG's ICT facilities. However, CsG presently have an IT department and the duties of the IT manager include carrying out maintenance, making sure all the systems are running up-to-date including the internet, and maintaining contact between the company and the ICT consultants. It is also the responsibility of the IT manager to ensure that the anti-viruses are up-to-date because of the nature of CsG's data and files which are backed up regularly using a back-up server to store data, in case of system crash. The company has a website that is functioning and uses some software such as Xero for managing the company's transactions.

5.3 Level of ICT Utilisation in the Case Studies

This section aims to determine the level of ICT utilisation amongst the seven SMEs that have been selected as case studies for the purpose of this research. A measure of the level of ICT utilisation simply means to identify the different types of ICT applications and facilities that are in use in the different SMEs. A wide range of ICT solutions/systems ranging from basic to sophisticated were identified as applications mainly used or utilised in the different SMEs, and these are highlighted below.

CsA uses ERP for planning and intranet for sharing vital information amongst its branches and departments. The company also have network servers for internet connection. CsB uses the Peachtree accounting software for compiling the company's information and for updating accounts. CsB also makes use of Hot Soft software for auditing and for providing effective and efficient services to guests. Likewise, the internet is used in CsB for sending emails and for general communication. CsC uses Business Soft accounting package, Microsoft office and the internet for communication. In CsD, a satellite dish and modem are used for internet access. Laptops and desktop computers are used for the different work stations in the company. CsD also makes use of other software that assists in monitoring security threats. CsE utilises mainly the internet and Microsoft office, the former being used for communication. In CsF, Peachtree accounting software is used for managing the company's accounts and the company also uses the internet and Microsoft office. CsG makes use of Xero software for handling its company transactions and utilises the internet and Microsoft office as well.

Although all the SMEs utilise or use some form of basic ICT, six of the SMEs (except for CsE that uses mainly the internet and Microsoft office) utilise one or more sophisticated ICT applications/systems. Interestingly, all the companies make use of the internet. A number of respondents regard the internet as a sophisticated ICT tool; however, in this research, the internet is regarded as a basic ICT tool just like the Microsoft package. Internet service is expected to be present in every workplace in this current era of globalisation and besides, basic or traditional ICTs are generally referred to as those packages or applications that can be used on a personal computer both at home and at work (Apulu et al., 2011).

The next section focuses on an in-depth understanding of factors affecting the effective utilisation of ICT in case studies A to G.

5.4 Factors affecting the Effective Utilisation of ICT in the Case Studies

Interviews which were conducted in the various SMEs enabled the researcher to elicit respondents' views and experiences regarding the utilisation of ICT. Every participant was given an opportunity to comment on the use of ICT in their respective companies. Although all the SMEs highlighted some positive impacts associated with the utilisation of ICT, nevertheless the participants identified some problems that have continually hindered them from effectively utilising it. The majority of the respondents from the various SMEs stated that a huge investment had been made in the acquisition of ICT systems/applications which were under-utilised, due to a number of factors militating against them. Different barriers ranging from socio-economic to technology related problems were identified. Thus, a number of factors that emerged from the interviews with the seven SMEs are presented below.

5.4.1 Electricity Constraints/Power Outage

Six SMEs (CsA, CsB, CsC, CsD, CsF and CsG) identified the lack of steady electrical supply as a major challenge to the effective utilisation of ICT in their individual companies. According to a respondent:

"……..Due to frequent power outage and fluctuations we [the company] are unable to use our [the company] computers in most cases….. There are days when we [the company] do not even open the cyber café" (IT Manager-CsB).

Similarly, another respondent comments:

"The major drawback with respect to adopting and effectively utilising ICT is the continuous power outage from our suppliers which adversely affects us [the company] as an SME. We [the company] do not have regular power supply in the country [Nigeria]" (Admin Manager-CsC).

Again, another respondent highlights:

"The key factor affecting the effective use of ICT in this company is the lack of regular electricity……As you [the researcher] can see, there is no electricity at the moment so the

computers are not in use. There is always power fluctuations…..most times it the reason why our computers crash" (Managing Director-CsF).

Comments from the respondents suggest that despite the successful adoption of ICT in the case SMEs, power outage or lack of electricity remains a major factor affecting the effective utilisation of ICT in almost all the companies. For instance, many SMEs spend a huge amount of money on diesel in order to power their generators due to lack of electricity as without electricity it is impossible to effectively utilise ICT.

5.4.2 Internet Service Providers (ISPs)

Four SMEs (CsA, CsC, CsE and CsG) acknowledged that the poor services provided by the different ISPs in the country, was another key factor affecting their effective utilisation of ICT. For example, a respondent comments:

"……We [the company] often have problems with the service providers……The internet service goes off frequently and sometimes could be unavailable for 24 hours or more. This has a huge negative impact on us [the company] because when this occurs [no internet connection] we are unable to send email and access information online. Generally, we [the company] are unable to communicate effectively with our [the company] business partners" (Managing Director-CsA).

The IT officer in CsA also made a similar comment:

"……We [the company] are not reaping the benefits of owning a server due to the problems we [the company] usually face from our service provider…….The network connection is always slow that we sometimes find it difficult to browse or send emails….they [ISPs] are just unreliable" (IT officer-CsA).

All the four SMEs listed above made similar comments concerning the frequent disconnection of the internet due to the poor services provided by ISPs in the country. Also, they stressed that the network is often very slow. This is because ISPs in Nigeria usually provide customers' internet connection with very low bandwidth which can be ineffective.

5.4.3 Lack of Skills

The lack of ICT skills has been identified by a respondent as a contributing factor affecting the effective utilisation of ICT in its company. The respondent asserts that:

"Many of the employees in this company do not have ICT skills except for those of us [IT manager] that work in the IT department so our [the company] staff are not effectively utilising ICT….. There is a need nowadays for every employee, to be conversant with operating a computer because in some organisations almost every job is done with the computer" (IT Manager-CsB).

This evidence suggests the need for companies to educate employees, enabling them to become computer literate.

5.4.4 Lack of Government policy/Support/Regulations

Two SMEs (CsA and CsD) identified problems with government policies/regulations and also the lack of support from the government as factors militating against their effective utilisation of ICT in their respective SMEs. According to one respondent:

"The lack of appropriate government regulations is another factor affecting us [SMEs]. If the government endeavours to improve or increase the number of ICT projects and programmes in the country, it will encourage many organisations like ours [SME] to increase our use or effectively utilise more ICT systems in our daily activities as a company. However, if the Nigerian government do not provide the enabling environment, it becomes impossible for many SMEs…..The government should fulfil their part by playing their role……" (Managing Director-CsA).

Similarly the other respondent notes that:

"…….From the government, we need a robust policy. The government needs to introduce policies that would support and help develop SMEs in the country [Nigeria]. SMEs require some level of support from the commercial banks but the rules that have currently been introduced by many of these banks are stringent especially for us as SMEs…… Currently, the government regulations are not even helping us [SMEs]…" (Managing Director-CsD).

Again, another respondent comments:

"……Also, there is no credit rating in the country, so it is very risky because SMEs have little credit approval or potential clients…This is because there is no support from the

government in terms of policy….. Despite their promises to improve SMEs in the country [Nigeria]" (Secretary-CsD).

Apparently, the comments made by SMEs imply that government promises were not always kept. Furthermore, insights from respondents suggest that government support would be of significant help to Nigerian SMEs. In other words, the government's role with respect to supporting SMEs adoption and increased use of ICT is a key to their successful deployment of more sophisticated ICT technologies.

5.4.5 Cost/Finance

Two SMEs (CsD and CsF) identified the running cost associated with independent generation of electricity as a major hindrance. Respondents from an SME stressed that:
"We [the SME] have to depend on our privately generated power source… It is very expensive to use generators and technology will not work without electricity. For example, in the last six months we have not had power supply for at least a day" (Managing Director and IT officer-CsD).

Similarly, the other respondent comments:
"Another issue is cost….The high cost of diesel is adversely affecting our business because we consume a lot [diesel] due to lack of electricity……and diesel is very expensive. Again, the ICT infrastructures are energy consuming so it costs us [the SME] so much to generate power to run our business and maintain our systems" (Managing Director-CsF).

Obviously, the comments infer that SMEs struggle with the high cost of purchasing diesel for fuelling their generating sets. This is as a result of the constant lack of electricity and based on the fact that some ICT infrastructures are energy consuming which in turn, hinders a number of them from effectively utilising ICT. Also, lack of funds is another major factor affecting Nigerian SMEs.

5.5 Drivers (Reasons) for ICT Adoption

The respondents were asked to comment on the reasons/drivers behind their decisions to adopt ICT. The participants gave a wide range of reasons that led to their decision to adopt ICT. These reasons have been grouped into some major areas which include:

5.5.1 Information Availability

A company identified the need for information availability as a driver for adopting some forms of ICT in both branches. According to one respondent:
"…….We [the SME] use ICT to obtain and manage information especially with regards to our [the company] sales target…..There is need for information availability at all times" (IT officer-CsA**).**

Similarly, another respondent from the same company comments:
"With the current developments in the area of technology, it is important to adapt to the new environment as a company… There is need for information availability at all times and for us [the company] to remain efficient in our duties. So, we decided to adopt ICT" (Managing Director-CsA).

5.5.2 Communication

Two SMEs' (CsA and CsE) reasons for adopting ICT are mainly for communicating with customers. CsA for example, decided to invest in a new on-line computer system because the company realised communicating with suppliers abroad was usually done by post which causes delays, as the company is unable to determine the delivery dates for their products by suppliers abroad. The company understood the need to build an effective communication channel with customers as well. The Managing Director and IT officer of CsA comment:

"Initially we [the company] used to use the manual system…… relying mainly on telephone conversions and sending documents by post which used to cause a lot of delays especially with the poor postal system in Nigeria and courier services like DHL can be very expensive. So, in order to solve this communication barrier we decided to adopt ICT. Presently we are communicating perfectly with our suppliers abroad and we are able to track our products online and we always know when our electronics will be delivered. Every business including small companies requires ICT" (Managing Director-CsA).

"The company decided to adopt ICT to enable easy communication with our staff in the other branches. Another major reason was for communication with our suppliers abroad which made the management to implement the intranet and also, servers for internet service so we [the company] can send email rather than sending information through the post" (IT officer-CsA).

5.5.3 Efficiency/Speed

Efficiency was also identified as a driver for ICT adoption. Four SMEs (CsA, CsC, CsE and CsG) decided to adopt ICT in order to become more efficient in their various business processes. CsC for example, decided to adopt a software mainly for increasing efficiency as highlighted below:

"The reason for adopting this Business Soft software is to increase efficiency. ICT is the technology of the day and the world is a global village therefore, as a company, we had to move from manual to electronic" (Branch Manager-CsC).

Another respondent comments that ICT brings about speed in the exchange of information.

"From the inception of the company, we [the SME] already knew what we wanted to do as a company. Since we wanted to reduce traffic [backlog] in our office, we had to adopt technology. We also have clients from abroad who do business with us [the company] through the internet…..This company can reach others online, we can check accounts online, place others online and there are no restrictions….ICT simply increases our speed and makes us [the company] more efficient so it was our major reason for wanting to adopt it" [ICT] from inception (Owner/Managing Director-CsG).

5.5.4 Automation/Easy access to data

Easy access to data has been identified as a reason for ICT adoption in CsB as described by the company's manager:

"…….When we started, we were using the manual system, but the hotel later got to know that with the manual system, when a person wants to refer to a job that has been done maybe 2 or 3 years ago, the person will have to go to the store and start looking for papers or files. There were very many paper works which the hotel found very difficult to handle. ……..However, the hotel management later discovered that it will be useful to automate the hotel's records by adopting technology [ICT] as it will be worthwhile and many of our employees will be relieved in terms of constantly searching for information. For instance, sometimes organisations will come to the hotel and request for past accounts e.g. the account for 2008 and we sometimes find it very difficult to provide them because they were all paper work which might have been misplaced by previous employees or trashed. ……In most cases, someone has to go through the pain of looking for all these papers so in order for all these not to happen, we as a company had to adopt a new system that is, ICT system that enables whatever we want to check or do so things will become

easier by storing the hotel's data on a system. The main reason for adopting ICT in this hotel is for easy access to data." (Hotel Manager-CsB).

5.5.5 Competitive Advantage

The need to have some forms of competitive advantage in a company, was identified by a respondent as the main reason for adopting/deploying ICT. This is described by the Branch-manager below:

"…. Also, for a company to maintain its competitive advantage or for a company to have value, the company must keep at pace with what goes on in the world. The world is moving from having to go to meetings and do your writing in long hand or having to use typewriters to write your letters, to using computers. So, for a company to deliver quality service, they must adopt ICT" (Branch-Manager-CsC).

5.5.6 Nature of Business/Profession

A responding SME thought it was important to adopt ICT due to the nature of their business. As a telecommunication company, they rely heavily on technology in order to successfully carry out their duties. According to the company's Managing Director:

"The major driver for ICT adoption in this company is due to the nature of the company's business….The company works with computer and other ICT infrastructures which help in the production of recharge cards for mobile phones. The company requires ICT infrastructures to help store these recharge cards as well. Furthermore, the company uses ICT for information management and accounts records…….The nature of our business needs a computerised counting infrastructure to meet up with the requirements of the business" (Managing Director-CsD).

"…….Also, being an IT professional is another reason. The company did not get any support from the government. The company had to initiate ideas on how to make things happen" (Managing Director-CsD).

5.5.7 Technological Advancements/Advertisement/Customer Satisfaction

It was noted that three of the participating firms (CsA, CsF and CsG) decided to adopt ICT just because it is the latest development. However, CsG went further to mention that ICT is

also used as a medium for advertisement and to satisfy their customers. While a respondent from CsF comments:

"The world globally is changing; technology is now at the forefront of every organisation" (Owner-manager/Managing Director-CsF).

Similarly, a respondent from CsG comments:

"ICT is what is in vogue nowadays. A company cannot do without technology. If an organisation is competing with other organisations that are ICT compliant, it is very important that the company is also able to compete. Information has everything to do with organisational advantage. If a company is not connected or do not have some form of ICT, it is very likely that people may not know that what the company has to offer… ICT is used for advertisement and it will definitely help every company to satisfy their customers"(Owner-manager/Managing Director-CsG)

Results from the cases suggest that all the companies are focused on one major reason, as mentioned by a respondent from CsC, for ICT being adopted, which is to have some sort of competitive advantage. None of the above would have mattered if the companies did not stand to gain some advantages by adopting ICT.

5.6 Impact of ICT on Organisational Performance (Benefits)

Respondents in each SME were requested to comment on the impact of ICT on their company's organisational performance. The responses to this question are similar to the responses that were given regarding their reasons for adopting ICT.

5.6.1 Competitive Advantage/Current Trend/Business Enhancement

One company is of the opinion that the impact of ICT is helping them stay competitive. According to a respondent:

"The company has been able to remain competitive in the retail market where many medium companies are facing immense difficulties just because we as a company decided to invest in ICT……ICT is currently the trend in the business world" (Managing Director-CsA).

Furthermore, the Managing Director of CsA mentioned that the use of ICT has assisted in enhancing the company's business, by helping the company to move forward:

"….Technology enhances our business… It moves your business forward. It makes things easier. I [the interviewee] have spoken to someone in the UK today, I have sent emails all around the world today, because I have internet. Ordinarily, it would have taken me 5 to 6 days to send a regular mail through the post to them" (Managing Director-CsA).

5.6.2 Efficiency/Speed/Shorten Lead Time

Of the seven SMEs that participated in the study, five (CsA, CsB, CsC, CsE and CsF) identified efficiency as an impact of ICT on their company's organisation performance. They all elaborated on the impact of ICT with regard to efficiency as presented below:

Two respondents from CsA comments:
"The computerisation of the company's organisational processes helps us to manage our data more efficiently. The intranet helps us to access information in other branches on a daily basis. The company can also access the market statistics online" (IT officer-CsA).

"…….ICT helps to shorten lead time in the company enabling the company to become more responsive to customers' needs and closer to the market demands……..It also helps us to update our stock records regularly" (Managing Director-CsA).

A respondent from CsB states that:
"The Hot Soft software is very good. It helps in providing effective and efficient services to our guests and also helps the company in the area of auditing……In summary, ICT helps us as a company to be more efficient" (Admin Manager-CsB).

Similarly, a respondent from CsC states that:
"ICT has been very helpful to the company. For example, comparing manual accounting to electronic accounting……Ever since we started using the accounting package, all we need to do is to key in the right information and it gives us the right financial statement……. ICT helps our management to work faster……it brings about efficiency. Also, ICT makes our work easier……. for example in taking record of stocks. In the past we use bill cards, it used to be time consuming, for example it used to take us weeks to get stock update and orders……. but since we started using the modern technology (ICT), we can do our stock within a few hours" (Admin Manager-CsC).

Again, another respondent notes that:

"Before the company adopted technology, it was somehow difficult to work. For example, if I [the interviewee] need to do a job or bookings maybe in Victoria Island, I have to go down there [Victoria Island] to do what I [the interviewee] have to do in person, which will consume my time and also take money and manpower….. But now that we [the company] have the internet, I [the interviewee] can sit down in the office and do what I want to do, within a twinkle of an eye. So ICT makes the job move faster and helps to save time as well" (Owner-Manager-CsE).

Furthermore, a respondent from CsF asserts

"ICT is fantastic. Without ICT this company will not have the power, strength and knowledge of how we [the company] can manage things [the company's operations] ourselves. ICT helps our company to allocate jobs to each department on the system using a computer which saves time. ICT is used for checks and balances of all our accounts. The company also makes good use of Microsoft office" (Accounts Manager-CsF).

5.6.3 Communication

CsA, CsC, and CsG commented that the use of ICT in their different companies has assisted in improving communication thereby having a great impact on their organisational performance. For example, the Administration officer for CsA states that:

"……The Company collects the phone numbers or email addresses of our [the company] valued customers and saves the data on the systems so we [employees] are able to send thank you messages, complements and also send them [customers] information on available offers via email or text. ICT helps in enhancing communication with customers and also, in managing data" (Administration officer-CsA).

5.6.4 Access Information

According to case studies CsB and CsE, there is easy access to information with the help of ICT. Respondents from CsB states that:

"ICT makes it very easy to access information" (Hotel Manager and IT Manager).

"The accounts software helps the hotel manager to access the balance of the account wherever he is in the world. ….There is also a CCTV which he [the Hotel Manager] can access wherever he is, through the internet. So, the manager can always have access to

what is going on in the hotel from his laptop. He does not have to be at the hotel all the time" (IT Manager-CsB).

5.6.5 Planning, Focusing and Forecasting

With respect to planning, focusing and forecasting, a respondent from CsD, a telecommunication company comments:

"ICT helps us in planning and focusing and forecasting….. Also, ICT helps in terms of database management, production and inventory…. ICT constitutes the life wire of the efficient management of the company's business" (Managing Director-CsD).

5.6.6 Increase Awareness and Profit

With respect to awareness and profit, a respondent inferred that the use of ICT assist in increasing awareness and profit in organisations. According to the respondent:

"ICT is interesting…. It has added so much to the body of knowledge….ICT offers a great opportunity for advancement by assisting to increase awareness in many companies especially now that companies are operating in a global world……..In terms of income, it has really helped many companies as well because virtually every aspects of life is now embracing ICT which makes it more lucrative for the company to get more benefits and make profit" (Managing Director-CsD).

5.6.7 Confidence

A company is of the opinion that ICT increases business confidence. According to the owner who is also the managing director:

"ICT helps to form the bedrock of an organisation. Having ICT infrastructure for example in the finance department would help to reduce traffic in many offices. People can also do business with a company online with the help of ICT which helps to improve confidence….. When a company has a website it brings about confidence…..People can go to the company's website and obtain the necessary information they need. It is also a marketing tool for any company. People may not know a company but when they see the company's website, they can download any information they require… With the bankers this company is using, a customer can pay money into the company's account and we [the employees] check it in the office and carry out a transaction for the customer. So a customer does not need to come to our office except if the person is coming for the first time for negotiation.

We [the company] also have our forms online which anyone can download, fill out and send it to us [the company] for business. ICT has been very good, in fact this company has really gained a lot of its market share from the use of ICT infrastructures and we are still trying to upgrade and make it better" (Owner-Manager/Managing Director-CsG).

The evidence demonstrates that there are several impacts associated the adoption or use of ICT in SMEs.

5.7 Drawbacks Associated with the use of ICT

Participants were requested to comment on the disadvantages or drawbacks they have experienced in terms of using ICT in their different organisations. The participants identified various drawbacks which include:

5.7.1 Over-reliance on Computers

The managing director of CsA states that:
"The only problem we [the company] have is over reliance on the computer so when there is power outage or no internet connection, we [the company] find it difficult to work" (Managing Director-CsA).

However, the IT officer and Administrative officer did not identify any drawback with the use of ICT.

5.7.2 Complex Modern Software Packages

In CsB and CsC, issues regarding modern software packages were highlighted, for example, the hotel manager of CsB commented about the difficulties of using modern software:
"ICT is growing each day and it is good but new systems should be developed in a way that will be easy to use……. Software should be developed in such a way that it can be easy to operate and understand. ….. Just by using the manual of the software without supervision for security reasons" (Hotel Manager-CsB).

5.7.3 ISP providers and Perilous Power Situation

CsD's managing director stated that the company had no regrets about adopting ICT because they cannot function without technology but complained about the ISP services in Nigeria which cause a drawback to their business.

"The service providers' situations in Nigeria are still at an elementary stage. For example you [the SME] may pay for internet subscription only to discover that the bandwidth is slow which is a drawback for us [the company] using ICT" (Managing Director-CsD).

Also, the Head of the IT department in the same company stated:

"The ICT infrastructures are energy consuming as we know of the perilous power situation in the country hence it cost us so much to generate power to run our business or to sustain our systems. Power outages and fluctuations affect the life span of the company's equipment" (Head of IT-CsD).

5.8 Other Issues affecting Some SMEs'

In CsE the owner-manager simply described ICT as "wonderful" but identified some issues that were affecting the company's business in general:

5.8.1 The Nigerian Economy

"……For example fuel scarcity in the country. The scarcity seriously affects this company, when as a company we want to carry containers from one point to the other. For instance there is fuel scarcity at the moment so we cannot transfer our [the company] containers" (Owner-Manager-CsE).

5.8.2 Bad Roads

"When we want to transfer goods, it usually takes a long time because of the bad roads which also make the truck drivers move very slowly. Besides, there is always traffic" (Owner-Manager-CsE).

5.8.3 Corruption

"Transport business in Lagos is not easy. Too many people collect tax, e.g LASMA, police etc…… extort money from the company's truck drivers. They arrest these drivers mainly to collect tips. Corruption causes delays in our business and most times stops the company from reaching its desired target" (Owner-Manager-CsE).

5.8.4 ISP providers' Poor Services and High Charges

Another issue that was raised by the owner-manager and also the secretary of CsE was the issue regarding internet service.

"The problem we [the company] face is with the company's server which has to do with the service providers…. sometimes the server can be very slow" (Owner-Manager-CsF).
"….Sometimes, the internet goes off. That is, we [the employees] cannot browse or log in which is due to problems from the service provider" (Secretary-CsF).

Additionally, in CsF the Administration manager states that the company experiences problems with their ISP in terms of internet connection while the managing director complained about the high charges from the internet service providers.

"There are no drawbacks with the use of ICT for now, except for the fact that sometimes we [the company] have slow internet speed from the ISP provider" (Administration manager-CsF).

"No, I don't see any problem with ICT or the internet except for the cost of paying monthly rates for internet service" (Managing Director-CsF).

5.8.5 Cost

Finally, the owner-manager/managing director of CsG clearly indicated that there were drawbacks with the use of ICT with regards to cost. The owner states:

"Definitely there are disadvantages associated with using ICT when it is observed critically……It is very expensive, that is why in our industry that is, the stock broking industry, most of the companies do not use ICT. It is only a few of these companies that deploy ICT to the level we [the SME] have reached. Many SMEs do not make enough

profit so it discourages them most times, and they tend to manage what they have without using ICT. Cost is a major factor" (Owner-Manager/Managing Director-CsG).

Based on the comments highlighted above, it can be concluded that a major drawback associated with the use of ICT is the problem with internet service providers. The high cost of internet service is another issue that can also be linked to the service providers. Likewise, there are issues with modern software packages in terms of ease of use as a respondent commented that modern softwares can often be difficult to use.

5.9 Factors that can affect the Further/Future Adoption of more Sophisticated/Advanced ICT Solutions

Based on the respondents' experiences with the use of ICT, they were asked if they would like to further adopt more advanced or sophisticated ICT applications/solutions in future. All the seven SMEs indicated their intention to utilise more advanced ICT solutions in future notwithstanding some respondents identified some factors that could possibly stop them from adopting these sophisticated technologies. Comments made by respondents from each of the participating SME are presented below:

5.9.1 Comments from CsA

A respondent from CsA comments:

"This company is a medium sized company which wants to move to a large scale. However, the company cannot reach that level until ICT infrastructure gets bigger. For example, a person cannot follow everything that goes on in the company and the company cannot depend fully on humans so there is a need to have something that is systemised, that can take care of every single entry. There is a need to have a sophisticated ICT system that can take the company to that level" (Managing Director-CsA).

"…….I hope in another 2-4 years things will get better in terms of ***ICT availability****,* ***internet connection,*** *and so on……. which will help companies to carry out various operations better. In Nigeria for example, every transaction is unique. It is not like in Europe where a company can have a system that manages some operations"* (Managing Director-CsA).

Furthermore, the managing Director of CsA notes that **internet connection** remains a key issue. Also, the Administrative officer, managing director and IT officer noted that:

"***Government policies create bottlenecks****…. It doesn't support SMEs"* (Admin Officer-CsA).

"Corruption*… In Nigeria there are many factors that affect the further adoption of advanced ICT. For example we [SMEs] need to tackle issues with bribes and so on which are unique [corruption] that SMEs must solve. The most difficult thing is how to manage these unique problems, for instance with the warehouse, police on the road etc…..Collecting data and storing it on a system can help to solve these small "headaches" and resolve intrusion issues. If such problems happen, an email can be sent…..which can help the management of a company to take strategic decisions. Therefore, companies should adopt ICT"* (Managing Director-CsA).

"Our service from the Internet Service provider has been epileptic (irregular)*……The company have six different networks but they are all slow and are not efficient"* (IT officer-CsA).

5.9.2 Comments from CsB

The company's future plans to adopt more advanced ICTs are highlighted by the hotel's manager:

"The hotel would like to adopt more technologies in future ….The company would like to have more specialist ICT systems that can enable the hotel to be more efficient and reduce redundancies …… There is no way we [the company] can meet up with the current trends in technology if we [the company] do not constantly upgrade our systems…..A company cannot have adequate patronage from people without the utilisation of ICT infrastructures. So as a company, there is a need to come out and do what others are doing and try to meet up with the standard of others by adopting specialised technologies that would help to make your business "stand-out"……... The company hopes to obtain the most sophisticated ICT equipment that would enhance our business……Also, we [the company] want to use ICT as a strategy to increase profit as every organisation is a profit oriented organisation ….. The hotel is here to make profit" (Hotel Manager-CsB).

With regard to factors that can affect the adoption of advanced ICTs the hotel's manager also states that:

"The cost of putting all the sophisticated technologies we require is a major factor *……The Company wants to have that which is in vogue. …. Also, another issue is that we [the company] may need to* ***train our staff*** *on how to use the sophisticated technologies which requires money as well, due to the* ***fact that many employees do not have ICT skills"*** (Hotel Manager-CsB).

The hotel manager also notes that:

*"……****Banks no longer give out loans to SMEs*** *due to the present economic situation in Nigeria that does not favour investment.* ***Banks are afraid of giving SMEs loans.*** *Hence, the greatest disadvantage to adopting more sophisticated technologies in this hotel is* ***working capital****……. Banks think SMEs will never refund their money especially when you [an SME] do not have collateral"* (Hotel Manager-CsB).

5.9.3 Comments from CsC

Concerning future plans towards the adoption of sophisticated ICT, the Branch-manager of CsC states that:

"….As the organisation is growing more and more, we [the company] would require some more advanced technologies"……In future, the company intends to adopt an ICT system for inventory that will keep this company's inventory record close to perfect" (Branch-Manager-CsC).

Meanwhile in terms of factors that can affect the adoption of more sophisticated ICTs, again the branch manager states that:

"……..Another factor that could affect future ICT adoption in this company is ***lack of skills****…. If employees do not have computer skills…..we [the company] will need to train these employees on how to use the computer and so on. …..They have to be computer literate but* ***the majority of our employees do not like change****….they are never ready to learn"* (Branch-Manager-CsC).

5.9.4 Comments from CsD

Regarding the company's future plans to adopt sophisticated ICT, the managing director of CsD states that:

"We intend to adopt more ICT, possibly to make our business 100% ICT based. Therefore we [the company] would want to have very high standard ICT tools. ICT is dynamic and keeps growing so whatever idea that will help the company to grow and develop will be good……..But it is the ***cost of putting the facility in place that is a major factor****. Also another issue is that we may have to* ***train our staff on how to use these technologies which is expensive****"* (Managing Director-CsD).

Challenges that could affect the adoption of more sophisticated ICT tools/applications in CsD are further highlighted below:

"……It is the ***finance because SME businesses generally do not have money. The cost of running an SME and cost of generating power is expensive. If government can fulfil their promise of giving us constant power supply****, then we [SMEs] will be happy to invest more in ICT"* (Managing Director-CsD).

Similarly, the administration manager of CsD noted that three major factors stand to affect the company's plan to adopt more advanced ICT in future. These are:
1. ***Financial constraints*** *which is a major internal factor* (Admin Manager-CsD).
2. ***Economic influence*** *which is an external factor…. Exchange rates have affected the Nigerian economy generally* (Admin Manager-CsD).
3. ***Lack of electricity*** *is another major factor* (Admin Manager-CsD).

5.9.5 Comments from CsE

According to the owner-manager in CsE:
"In future, we would like to adopt some advanced ICTs better than what we have presently….Technology can bring about a huge competitive advantage. The company intends to adopt more ICT in future to an extent that the company can even sell goods online and accept payment online" (Owner-Manager-CsE).

Furthermore, CsE's owner-manager emphasised that factors which can affect further adoption of especially sophisticated ICT applications in the company include:
*"****Ignorance [Lack of awareness]*** *as many of the company's staff still do not know the benefits that comes with technology"* (Owner-Manager-CsE)

"Also, ***lack of electricity*** *is a factor as it is very expensive to use generators and technology will not work without electricity. For example, in the past few[three] months we have not had electricity"* (Owner-Manager-CsE).

Again, the Secretary of the company also states that:
*"****Power failure*** *is a major factor…..There is nothing a company can do effectively without electricity and that is where fuel now comes in. This company is always spending a lot of resources on buying fuel for generators since there is no electricity"* (Secretary-CsE).

5.9.6 Comments from CsF

The future plan for the adoption of more sophisticated ICT has been highlighted as follows:
"The company intends to adopt more ICT facilities and software packages in future" (Managing Director).

"The company will certainly want to adopt more advanced ICTs in future" (Admin Manager-CsF).
"I will certainly recommend the use of ICT for all SMEs because it enables every organisation in terms of efficiency" (Chief Accountant-CsF).

With respect to factors which could affect the further adoption of ICT, the managing director states that:
"I [the managing director] will say that our company is the first to adopt an ICT application such as SAP in this area. The company lost seven staff that were properly trained on SAP because large companies decided to hire them….The training was well conducted for all the staff but, I [the managing director] must say that some of our [the company] staff do not like change [not ready to learn]. ***They are never ready to participate****"* (Managing Director-CsF).

5.9.7 Comments from CsG

In CsG the owner is happy to adopt a more sophisticated ICT in the near future:
"This company is definitely happy to adopt more ICT when the company makes sufficient profit because the major problem the company has, is the cost of the sophisticated ICT facilities……The cost is what scares many SMEs. In future we [the company] want to have

our own infrastructures like web server and mail servers and we [the company] do not want to depend on consultants, we want to have our own complete infrastructure like many of the banks"(Owner-Manager-CsG).

The managing director further added that:
"No one can fight technology. Every company need to get along with technology. I don't think any company can say that they don't want to adopt more sophisticated technologies or increase their use of technology in the future" (Owner-Manager-CsG).

Respondents from CsG were also asked to identify factors that could hinder the company from successfully adopting some advanced technologies in future.

"In my own opinion, the only challenge that could stop us [the company] might be ***government policies because they don't consider the small sector"*** (Owner-Manager-CsG).

"*…Some people [employees] that are not really ICT inclined* *can stop us from going into deep ICT because we would have to train to them. ICT is going to help everyone. It will help the company a great deal and ICT is good for marketing…..We all know that ICT is enjoyable and smooth but, in Nigeria another problem is* ***security [Fraud]***. *People want to make fast money especially in the area of internet service. Internet service providers offer us [the company] very low bandwidth and they [ISP] will share the same bandwidth for more than 1000 people yet the company pays so much money for their services. So… these are issues that can frustrate further ICT adoption in the company"* (Head of IT-CsG).

According to the owner-manager:
*"****Financial incapability*** *as most often the amount of capital the company requires to do business is not available. As a company, we need a financial institution to back us [the company] up. Most often we as a company do not have anything to offer. Most of the companies in Europe that give us [the company] products, they want a kind of confirmation from our banks that we have enough funds and we can deliver quality service if you are given the products….But,* ***Nigerian banks are not always there for SMEs as customers****"* (Owner-manager-CsG).

"As for internal hindrance or factor, it is unlikely as an SME, that the company will be able to afford ***the cost of hiring the service of a data entry clerk or the required expertise in other areas of our [the company] business"*** (Admin officer-CsG).

*"****The energy [electricity] situation in Nigeria is very bad*** *which is a factor that is very difficult to overlook. The cost associated with provision of electricity in Nigeria is so high that people find it difficult to attend to other issues in their companies. If this cost of electricity can be reduced, then SMEs will have the urge to attend to other issues such as technology adoption"* (Chief Accountant-CsG).

The numerous comments made by participants from the different SMEs simply confirm that all the companies are willing to adopt more advanced or sophisticated ICT applications/tools in order to advance in their business processes; however, there are several factors that continue to militate against them and can seriously affect their future plans with respect to increased technology adoption.

5.10 Participants' Advice/Recommendations to SMEs

Respondents from every SME were given an opportunity to advise other SMEs based on their experience with the use of ICT. Six SMEs (CsA, CsB, CsC, CsD CsE and CsF) responded.

In CsA, the IT officer recommended that:
"In the next 10-15 years no company can survive without having the basic ICT infrastructures for example, owning at least a computer. Every small company should own a computer (IT officer-CsA).

In CsB the hotel manager stated that:
".....Before SMEs can get to the next level of procuring advanced technologies, they will require money and most SMEs do not have money..... So I want to tell SMEs to just remain patient" (Hotel owner-manager-CsB).

The Branch- manager of CsC advised that:
"All SMEs should adopt ICT because it would assist to improve their sales and the day-to-day running of the business" (Branch-Manager-CsC).

While the Managing Director of CsD states that:

"Gone are the days where embracing ICT seems to be a status symbol. ICT is now an essential tool and a lifeline in all fields. For example, even a farmer should use technology in approaching farming from a different perspective. ICT adds value to SMEs. ICT helps in account management which is a problem in many SMEs. This means management of accounts for financial information that can easily be done with a computer. ICT helps in terms of accuracy, therefore it is essential that companies adopt it. ICT is a good working tool so the earlier SMEs adopt ICT, the better for them" (Managing Director-CsD).

"I would advise other SMEs that do not use ICT, to use it a little even if it is to buy a laptop or a computer and connect it to the internet. Also, SMEs should endeavour to own a website. SMEs need to advertise themselves and the best way is through a website because people can access the company and get to know the company better rather than going to the radio and television media which will require more money for advertisement" (Head of IT-CsE).

"The volumes of data that are hovering around in the industries nowadays are so voluminous that a company cannot do without using ICT to handle or manage data. Therefore, if SMEs really want to have some form of competitive edge, they need to use various technologies" (Managing Director-CsE).

Furthermore, CsE managing director states:

"To the best of my knowledge, I still think a lot of SMEs do not use ICT but ICT is very good and our company is willing to adopt more ICT. It helps to widen a company's scope and enhances your relationship with other companies. I would recommend that all SMEs adopt some form of ICT……Once a company can use the internet and use good software and also maintain their systems, the company is bound to experience some level of development. In future, we want to use better software to manage the company's accounts for example, Sage software" (Managing Director-CsE).

Finally, CsF recommends that

"Companies should embrace ICT. SMEs should embrace technological advancements. It makes a company to grow faster" (Managing Director-CsF).

Table 5.12 presents a coding structure displaying the themes identified in the qualitative data.

Table 5.12: Coding Structure

Categories	Description	Codes
Inhibitors	Provides reasons for the non-adoption or under-utilisation of ICT amongst Nigerian SMEs.	1. IN. Electricity/Power outage 2. IN. ISPs 3. IN. Inadequate Skills 4. IN. Government Policy/Support 5. IN. Cost/Finance
Drivers/Motivators	Identifies drivers, motivators or reasons for the adoption of ICT in Nigerian SMEs.	6. DR. Information Availability 7. DR. Communication 8. DR. Efficiency/Speed 9. DR. Automation/Easy Access 10. DR. Competitive Advantage 11. DR. Business Type/Profession 12. DR. Technological Advancement/Customer Satisfaction
Impact	Provides information about the impact or benefits of ICT in the organisational performance of Nigerian SMEs.	13. IM. Competitive Advantage/ Current Trend/Business Enhancement 14. IM. Efficiency/Speed 15. IM. Communication 16. IM. Information Access 17. IM. Planning/Forecasting 18. IM. Awareness/Profit 19. IM. Confidence
Drawbacks	Identifies drawbacks or disadvantages associated with the use of ICT in Nigerian SMEs.	20. DB. Over-reliance on computers 21. DB. Complex software packages 22. DB. ISPs service 23. DB. Power outage
Other Drawbacks	Identifies other general problems affecting SMEs in Nigeria.	24. ODB. Country's Economy 25. ODB. Bad Roads 26. ODB. Corruption 27. ODB. ISPs poor service/High charges 28. ODB. Cost
Factors	Provides information on factors that can hinder the further adoption of ICT in Nigerian SMEs.	29. FA. Irregular internet service 30. FA. Poor government policies 31. FA. Corruption 32. FA. Cost/Financial constraints 33. FA. Lack of Banks' support 34. FA. Lack of skills 35. FA. Employees culture 36. FA. Lack of awareness 37. FA. Security/Fraud

5.11 Summary of Research Findings

A summary of the research findings from the case studies is given in the following tables: Tables 5.13, 5.14, 5.15, 5.16, 5.17, 5.18, 5.19 and 5.20.

Table 5.13: Level of ICT Utilisation (Types of ICT applications in SMEs)

	Basic ICT	**Sophisticated ICT**
CsA	Internet Microsoft package	ERP, Intranet, Network servers
CsB	Microsoft package Internet	Peachtree, Hot soft, CCTV
CsC	Microsoft package and Internet	Business soft software
CsD	Microsoft package and Internet	Satellite dish, Modem, work station, security software
CsE	Microsoft and Internet	
CsF	Microsoft and Internet	Peachtree software
CsG	Microsoft Internet and antiviruses	Xero software

Table 5.14: Factors Affecting the Effective Utilisation of ICT in SMEs

Factors	**Cases**
Electricity constraints	A, B, C, D, F and G
ISP Providers	A, B, E and G
Lack of skills amongst employees	B
Lack of government policy/support	A and D
Cost Finance	D and F

Table 5.15: Drivers for ICT adoption

Drivers	**Cases**
Information availability	A
Communication	A and E
Efficiency/Speed	A, C, E and G
Automation and easy access to data	B
Competitive advantage	C
Nature of Business	D
Technological advantage/advertisement/customer satisfaction	A, F and G

Table 5.16: Impact of ICT on SMEs organisational performance

Impacts	**Cases**
Competitive advantage and current trend	A
Efficiency/speed/shorten lead time	A, B, C, E and F
Communication	A, C and G
Access to Information	B and G
Planning and Forecasting	D
Business Enhancement	A
Increase Awareness and Profit	D
Confidence	G

Table 5.17: Drawbacks associated with the use of ICT

Drawbacks	**Cases**
Over-reliance on computers	A
Complex modern software packages	B and C
ISP provider and perilous power situation	D

Table 5.18: Other issues affecting some of the SMEs

Issues	**Cases**
Fuel scarcity; Bad roads and Corruption	E
ISP providers poor services and high charges	E and F
Cost	G

Table 5.19: Factors that can affect the further/future adoption of more sophisticated ICT applications

Cases	**Factor**
CsA	• Poor Internet connection • Government policies • Corruption
CsB	• Cost of adoption • Training of staff • Lack of skill amongst employees; • Lack of Working Capital due to banks' reluctance
CsC	• Lack of skills • Reluctance to change amongst employees
CsD	• Cost of implementation of sophisticated ICTs • Cost of staff training • Lack of skills • Running cost (maintenance) • Cost of generating power (Electricity) • Financial Constraints
CsE	• Ignorance/Lack of awareness • Power failure
CsF	• Willingness to accept change
CsG	• Government policies • Lack of skills • Security and Integrity • Lack of finance • Cost of hiring consultants • Electricity

Table 5.20: List of Participants

Companies	List of Participants
CsA	1. Managing Director 2. IT officer 3. Admin officer
CsB	1. IT Manager 2. Hotel Manager
CsC	1. Admin Manager 2. Branch Manager
CsD	1. Managing Director 2. Secretary 3. IT officer 4. Head of IT 5. Admin Manager
CsE	1. Managing Director 2. Owner-Manager 3. Secretary 4. Head of IT
CsF	1. Managing Director 2. Accounts Manager 3. Owner-Manager 4. Secretary 5. Admin Manager 6. Chief Accountant
CsG	1. Owner-Manager/Managing Director 2. Head of IT 3. Admin Officer 4. Chief Accountant

5.12 Summary

This chapter has presented the findings of the data obtained from the survey that was conducted in the first phase of the research in order to identify successful adopters of ICT amongst SMEs in Lagos, Nigeria. The survey was based on a sample of 66 SMEs and the results show that there are several issues inhibiting a number of Nigerian SMEs from adopting ICT. For example, lack of electric power and lack of skills were identified as the two major barriers hindering the adoption of ICT amongst SMEs in the region that participated in the study, with 48% and 44% respectively. Nevertheless, a number of respondents indicated that lack of knowledge (30%) is a barrier and this could be linked to their skills' shortage. Furthermore, the findings also identified that the majority of the SME participants are adopters of ICT but mainly use Microsoft packages in terms of software applications and the internet in terms of communication application.

The chapter has also presented findings from the interviews conducted in the second phase of the study and identified some factors affecting the effective utilisation of ICT as well as factors inhibiting the adoption of more sophisticated ICT applications. The research further identified some impacts of ICT on the organisational performance of the case SMEs and has highlighted drivers behind their decision to adopt ICT. Advice/recommendations were provided by a number of participants who took part in the interviews in order to help SMEs that are yet to adopt ICT, to begin to adopt, especially with the current developments in the world.

CHAPTER 6 – DISCUSSION AND THE DEVELOPMENT OF A FRAMEWORK FOR STIMULATING THE ADOPTION AND EFFECTIVE UTILISATION OF ICT IN NIGERIAN SMEs

6.0 Introduction

The purpose of this chapter is to examine the findings of the research in relation to the research questions. The chapter discusses the findings presented in Chapter 5 and compares them to the literature review. Insights from the survey and case studies have assisted in providing a robust view on issues related to the subject under consideration. The chapter forms a narrative of the entire thesis incorporating ideas that have emerged over the course of the research and, whenever possible, the results are compared with previous findings. The research findings for each of the five research objectives are summarised and explained within the context of current academic knowledge and the chapter concludes with a proposed framework that can stimulate ICT adoption and utilisation amongst Nigerian SMEs. The chapter is structured into five sections based on the study's five sub-research questions, in the order presented below.

1. What are the motivators for and inhibitors to ICT adoption in Nigerian SMEs?
2. What is the current level of ICT utilisation amongst SMEs in Nigeria?
3. How does the use of ICT affect/impact on the organisational performance of Nigerian SMEs?
4. To what extent do Nigerian SMEs utilise sophisticated ICT systems?
5. How can the adoption and utilisation of ICT be improved in Nigerian SMEs?

6.1 Motivators and Inhibitors of ICT

The following sections present the identified motivators and inhibitors of ICT adoption amongst Nigerian SMEs.

6.1.1 Motivators

The first sub-research question was aimed at identifying motivators and inhibitors of ICT adoption amongst Nigerian SMEs. Studies on ICT adoption constitute a substantial area

within the information systems domain, notwithstanding that there continues to be a need to better understand the factors that motivate or inhibit the adoption and use of ICT within the specific context of SMEs (Harindranath et al., 2008b). This is as a result of the impact of globalisation which has forced so many SMEs to adopt ICT as a means of survival and staying competitive in the present era. The current use of ICT in many organisations in recent times has caused some form of revolution in their business practices (Apulu and Latham, 2011a). This research supports the work of Rastrick and Corner (2010), Lin and Lin (2006) and Melville et al. (2004) who stated that ICT is increasingly becoming related to organisational values and that there is growing support for the positive relationship between ICT and its advantages. The wide use of ICT is changing the manner in which people or organisations work as it has assisted in providing several opportunities to organisations thereby assisting them to meet the challenges of an ever-changing environment. A total of seven factors have been identified from the case studies as motivators for ICT adoption in Nigerian SMEs as discussed below.

6.1.1.1 Information Availability

Insights gained from the investigation suggest that the need for constant access to information at all times is a key motivator for SMEs' decisions to adopt ICT in Nigeria as ICT daily increases the availability of information in many of the SMEs and enhances decision making within these organisations. The finding supports Ongori and Migiro's (2010) assertion that ICT adoption in SMEs provides a means to access, process and distribute greater amounts of data and quick information in order to make thoughtful decisions. It appears that with the recent technological developments in every aspect of life, some SMEs in Nigeria are keen to adopt ICT, especially as the evolution of technology has continued to change the manner in which many businesses operate.

6.1.1.2 Communication

The need for effective communication with staff, customers and suppliers amongst others cannot be overemphasised as the utilisation of ICT enables organisations to increase their communication capabilities. For example, insights from the case studies reveal that a company was forced to adopt ICT in order to improve their means of communication with suppliers abroad which was usually done via the post. Communicating via the post caused several delays for the company as often, the company was unable to receive the delivery dates of their products from their overseas suppliers on time. But now with the aid of ICT such as the internet, the company can communicate effectively with their suppliers

overseas via email. The use of email has assisted in speeding up communication within and between many organisations. This suggests that the adoption of ICT would not only assist in speeding up communication but also in cutting down courier costs.

Communication is vital for every business and Klas et al. (2008) affirm that communication can occur over large distances without problems, with the use of ICT systems. Effective communication provides the critical link between core functions in every organisation and plays a key role in the area of collaboration between various parties as well. Wertheim (no date), also states that people in organisations typically spend over 75% of their time in interpersonal communication thus it is no surprise to find that at the root of a large number of organisational problems is poor communications. The finding aligns with Clegg et al's (2005) study, stating that communication is not just the flow of information between people but also a process of "creating, shaping and maintaining relationships and enacting shared values, common culture, agreed goals, and means for their achievement". The finding also corroborates with Golding et al (2008) study which states that ICT improves communication systems, either internally to the firm or to an already established network of firms involved in productive or commercial relationships that make communications within the firm faster. Furthermore, ICT provides a strategy for reducing communication costs as emails, intranets and other electronic media could be used to cut costs and provide an effective means of communication. Again with ICT, information can be sent to multiple recipients at the same time assisting in saving delivery costs and time. The empirical findings conclude that there is need for organisations, including SMEs, to adopt ICT in order to achieve a substantial level of effective communication.

6.1.1.3 Efficiency/Speed

Insights from the investigation have revealed that the need for Nigerian SMEs to remain efficient is another reason why some of them choose to adopt ICT. The majority of SMEs' owner-managers and employees from the different organisations that participated in the interviews identified their desire to improve efficiency as a reason for adopting ICT. Results from the case studies also indicate that the manual processing of data was cumbersome which motivated some SMEs to adopt ICT in order to improve their company's operational efficiency. For instance, a respondent mentioned that their company went on to adopt ICT to enable them to become more efficient thereby increasing the speed at which they carry out their business. Generally, ICT can help to increase productivity,

efficiency of inventory control and increase sales through closer relationships and faster delivery times.

The finding is consistent with that of Chen and Papazafeiropoulou (2008) who state that the adoption of technologies can be seen either as a way to provide efficiency savings, or as a strategic response either driven by necessity or due to competitive pressure. Efficiency is an important dimension in every organisation as it brings about organisational effectiveness. Levy et al. (2001) also found that investment in ICT is successful when it takes one of the following two forms: providing efficiency and savings, or enabling added value. Embracing technology as a tool for efficiency would help lift up the organisational competencies of many SMEs. Besides, Alam and Noor (2009) in their study confirm that the adoption of ICT is a means of enabling businesses to compete on a global scale, with improved efficiency, and closer customer and supplier relationships. This confirms that with effective utilisation of ICT, companies can begin to manage their resources more efficiently.

6.1.1.4 Automation/Easy access to data

Automating a company's records enables easy access to data and was described by some respondents as a motivator for their decision to adopt ICT. Generally, the automation of business processes in companies provides a quicker means for achieving their desired output. Furthermore, ICT not only creates a medium for easy access to data but also helps to build a repository where information can be stored. With ICT, handling a company's information and producing reports can be straightforward as the details are usually stored on a system. Overall, ICT helps in facilitating the access to information in organisations. An SME manager confirmed during the interviews, that the use of a manual system was stressful, especially when the need to access documents arises and the documents were stored in cabinets. This made it very difficult for the company to access specific details. However, with the adoption of ICT, the company is now able to save all its data on various computers thereby enabling easy data access.

This finding validates that of Ongori and Migiro (2010) which confirmed that ICT adoption in SMEs would provide a means to access, process and distribute greater amounts of data and information quickly in order to make thoughtful decisions. Chen et al. (2003) also state that automating a company's process can shorten the cycle time from ordering to distribution, thus resulting in enhanced production ability and increased efficiency. Suppliers can also benefit from ICT adoption as it will shorten business transaction cycle,

lower capital cost of stocking, lower labour cost, increase efficiency, enhance accuracy and give faster handling time and delivery speed (Chen and Papazafeiropoulou, 2008).

6.1.1.5 Competitive Advantage

Having some form of competitive advantage was described by the case SMEs as a major force behind their uptake of ICT. The empirical findings from the case studies reveal that SMEs try to have a competitive edge over their competitors by simply enhancing their customer service. It was observed that all the SMEs are searching for new ways to stand out hence they are ready to use ICT applications/systems as a strategy for staying competitive. Similarly, the study of Adebambo and Toyin (2011) mentions that the current highly competitive global marketplace puts pressure on organisations to find new ways of creating and delivering value to customers. Furthermore, one SME that participated in this research acknowledged the necessity to deliver business value and to have some form of competitive advantage as a motivator behind the company's decision to adopt ICT. It is very important for every company to maintain its competitive advantage by, for instance, providing unique services to customers. According to another respondent *"for you to deliver quality service, you must adopt ICT"*. In other words, empirical evidence suggests that competitive pressure is a key motivator of ICT adoption in Nigerian SMEs.

6.1.1.6 Nature of Business/Profession

The research findings suggest that the nature of businesses plays a critical role in the adoption of ICT. A telecommunication company for example, indicated that the nature of their business was the main motivator for adopting ICT as it is impossible for them to function without utilising ICT. The company uses computers and other ICT infrastructures in the production of recharge cards for mobile phones. This finding relates to that of Mpofu et al. (2009) who state that the organisational readiness of every organisation is reflected in the size, type, nature of business as well as ICT expertise and the perceived benefits upheld by management and employees. This proves that the nature or type of business can also be regarded as a key motivator for the adoption of ICT amongst SMEs. In the case of the telecommunication company, it would have been impossible to function without the effective utilisation of ICT systems.

6.1.1.7 Technological Advancements

The level of technological advancements in recent times has compelled some owners/managers of SMEs to adopt ICT tools as a means of enhancing their business

processes. Insights from the case studies confirm that the latest technological advancements in the business world motivated some of the SMEs to partake in the adoption of ICT, as ICT is now being applied in virtually every area of our daily lives. Ongori and Migiro (2010) assert that the impact of globalisation has compelled SMEs to adopt ICTs, to enable them survive and compete with large companies; they emphasise that the evolution of technology has affected the pattern in which businesses operate by changing industry structures and altering the degree of competition.

Moreover, results from the case studies confirm that ICT adoption has assisted in creating some form of competitive advantage for many businesses. This finding supports Barba-Sánchez et al.'s (2007) research which identified that the widespread use of ICT is changing the manner in which people or companies function. The authors describe the utilisation of ICT as a feature of technological advancements in the current era where there has been immense innovation in information management and communication. This finding confirms that recent technological advancements have made some Nigerian SMEs to adopt or effectively utilise ICT and have also, revolutionised the method in which some SMEs in Nigeria interact and conduct their businesses.

6.1.1.8 Advertisement

The case studies' findings indicate that the use of ICT, such as the internet, assist SMEs to advertise their products and services and also enables businesses to reach out to a wider audience. A company sells itself once it is visible and can be easily reached and accessed. Similarly, Lawrence (2009) acknowledges that the internet provides businesses with a 24 hours a day, seven days a week global sales outlet. The internet enables businesses to reach out to new markets that could not previously have been accessed. One interviewee stated that *"nowadays if a company is not ICT compliant, there is the likelihood that people may be unaware of the company's products and services"*. Thus, it can be concluded that having a corporate website as an SME would enhance the quality of service that is provided to customers and could further assist in attracting new customers, especially if the website has information on the various products and services that are being offered by the company.

Apulu and Latham (2011c) confirm that having a website simply provides a better profile for SMEs since technology is now the 'order of the day'. With a website, a business becomes visible and easier to be reached as the company's profile can be viewed by the general public. Once the company makes its profile visible by opening its own website and

letting others have access to the site, the company gains market recognition which helps to increase the company's marketing chances. This implies that ICT can be used as a medium for advertisement and also as a strategy for customer satisfaction.

6.1.1.9 Customer Satisfaction

A number of the cases were motivated to adopt ICT as a strategy for satisfying existing customers since customer satisfaction is crucial to every organisation. Customer satisfaction would assist in improving the rating of a company and the use of ICT can provide various means by which a customer can be satisfied. Nevertheless, it is important for the technology that is being adopted to meet a company's organisational needs, otherwise it becomes difficult to realise the company's proposed objectives. This is because a customer's satisfaction depends on the performance of the SME in delivering value that is relative to the customer's expectations. For example, if a performance falls short of a customer's expectations, obviously the customer will be dissatisfied but if a performance meets a customer's expectations, the customer will definitely be satisfied.

Madya and Nor (2008) confirm that if performance exceeds expectations, the customer will be delighted. This shows that the use of ICT can improve the service quality of an organisation. The finding corroborates that of Narayanasamy et al.'s (2008) research which states that the competition between SMEs with regard to achieving higher customer satisfaction is a powerful business objective since satisfaction is an overall indicator of how well customers rate a company. Furthermore, this research supports the findings of Harindranath et al. (2008b) who identified that most ICT investments made by SMEs in Southeast England were to increase operational efficiency, improve communications with suppliers, improve or enhance customer service, and keep up with competitors, amongst others. The research findings reveal that the use of ICT has the potential to enhance the level of customer satisfaction in Nigerian SMEs as it provides an opportunity to offer exclusive services to clients which can help a company to retain its customers.

6.1.2 Inhibitors

Although results from the case studies have identified different motivators for ICT adoption in Nigerian SMEs, as presented in section 6.1.1, a number of inhibitors hampering the adoption of ICT were identified by non-adopters in the survey conducted in the first phase of the research. Whilst empirical findings from the survey indicate that many SMEs in the region tend to have adopted ICT (either basic or sophisticated), the

results also identify a number of issues inhibiting some SMEs in Lagos from experiencing the benefits associated with the adoption of ICT in businesses. The majority of the non-adopters surveyed were concerned about infrastructural inadequacies in the country such as electricity constraints and so on, as well as the lack of skills amongst employees. These concerns were ranked 1st and 2nd respectively. A discussion on the various issues raised by the survey participants is presented below; and evidence from the case studies provides additional information on factors inhibiting ICT adoption in Nigerian SMEs.

6.1.2.1 Lack of Electricity

The survey results indicate that the most prevalent factor inhibiting the adoption of ICT amongst a number of SMEs in Lagos, Nigeria is the lack of electricity. Electricity constraints in Nigeria have remained a bane to the adoption and effective utilisation of ICT amongst many Nigerian SMEs. Baker (2008) affirms that although Nigeria is recognised as the largest producer of oil in Africa and holds approximately one third of the proven gas reserves, the lack of electricity supply has continued to be a major problem in the country especially in rural areas where there is often total blackout. Moreover, in the cities where there is electricity, it is still very limited which has made power shedding a customary occurrence. It is very rare to live for a day in Nigeria without uninterrupted power supply yet the cost associated with its provision remains very high.

The literature review and empirical findings of this research suggest that Nigerian SMEs are currently facing enormous challenges with regard to the provision of utilities such as electricity, and so on. This has made many SMEs resort to approaching private companies for support (see Chapter 3) and it prevents them from successfully adopting or utilising ICT. This finding is also in line with Tallapragada's (2009) study which states that despite Nigeria's tremendous energy resources, the country still remains highly energy deficient.

6.1.2.2 Lack of Requisite Skills

Results from the survey suggest that some SMEs are yet to adopt ICT simply because they lack the requisite skills. This finding corroborates that of Alam and Noor (2009) who identify the lack of suitable technical and managerial staff with sufficient ICT expertise as a major barrier to ICT adoption in Malaysian SMEs. The authors explain that SMEs have continually lacked skills amongst their workforce. Again, MacGregor et al. (1996) confirm that some SMEs avoid the use ICT in their businesses, especially if it is considered to be complex.

Furthermore, Reynolds et al (1994) established the fact that SMEs owner-managers are unlikely to adopt technologies if they lack the requisite skills. This infers that employees' skills and those of owner-managers are crucial to the successful adoption of ICT within SMEs in general thereby validating the finding of this research. It is important to note that the lack of skills amongst owner-managers and employees can also inhibit the effective utilisation of ICT amongst SMEs that have successfully adopted ICT, thereby inhibiting them from adopting more sophisticated technologies. This validates the research of Apulu et al. (2011) involving 25 SMEs, which identifies skills deficiencies as a factor affecting a number of SMEs that have successfully adopted ICT from further adopting more sophisticated ICT solutions. Researchers (e.g. Darch and Lucas, 2002; Ramsey et al., 2003) confirm that a shortage of ICT skills and unfamiliarity with the internet and its potential are found to be reasons for a lack of adoption by SMEs.

6.1.2.3 Lack of Knowledge of ICT

Lack of knowledge is considered to be another inhibitor. Without knowledge it would be difficult for the SMEs, in this context, to acquire the requisite skills. Although most of the non-adopters had a positive view regarding the use of ICT, they identified that their lack of knowledge on how to use computers remains a major issue for non-adoption. A number of respondents expressed their desire to acquire some knowledge on the use computers and the internet if given the opportunity to do so. This research finding supports that of Duan et al. (2002) who note that lack of ICT skills and knowledge in SMEs is one of the major challenges faced by all European countries, particularly in the UK, Poland and Portugal (See chapter 3).

Likewise, Lee and Kim (2004) advocate that the lack of technological knowledge and their management capability amongst employees can be a barrier to the adoption and extension of information systems. Lee and Kim (2004) further highlight that some SME managers are concerned about the introduction of ICT because of the fear that their employees may not be familiar with it. This corroborates earlier literatures (e.g. Costello et al., 2007) that identified the lack of knowledge on how to use technology and low computer literacy as factors that can affect ICT adoption. Therefore, for a successful implementation of ICT in Nigerian SMEs, it is vital that employees and managers acquire some knowledge of ICT as well as the right technical skills.

6.1.2.4 Cost of Investment/Training/Maintenance

Issues such as cost of training, investment cost and maintenance were also identified in the survey as inhibitors. Some respondents indicated that the investment cost required to implement ICT was very high. Interestingly, insights from the case studies suggest that cost remains a critical issue for SMEs that are already utilising ICT. This perception is consistent with Lee and Kim's (2004) study which emphasises that even the adopters of ICT are unwilling to upgrade their information systems or to adopt other advanced ICT service applications as a result of high adoption cost. The cost of training employees has continued to be a key issue in SMEs; moreover, SMEs in Nigeria do not develop training plans as many owners/managers are reluctant to invest in training their employees because they are afraid of losing their employees to large companies upon the completion of such trainings, which is in line with Arendt's (2008) research. Meanwhile, some SME managers are of the opinion that maintaining ICT infrastructures requires a substantial amount of money considering the fact that many Nigerian SMEs struggle with inadequate finance to run their businesses. Furthermore, the finding confirms the proposition of Apulu et al. (2011) which claimed that the high cost associated with ICT implementation makes SMEs in most cases ignore the adoption or effective utilisation of ICT.

6.1.2.5 Owner-Manager's Lack of Awareness

The non-adoption of ICT has also been attributed to some owner-manager's lack of awareness. Surprisingly, a number of owner-managers indicated in the survey that they were unaware of the advantages that are associated with the use of ICT in firms. This result validates the findings of Apulu and Latham (2009c) and Chibelushi and Costello (2009). Apulu and Latham (2009c) identify that a number of SME owner-managers in Nigeria are not familiar with the conceptual basis and potential benefits of adopting ICT. Also, Chibelushi and Costello (2009) explain, in their research with SMEs in the UK, that a lack of awareness could hinder SMEs from understanding the potential benefits that are associated with more recent or sophisticated technologies, which could further increase SMEs' efficiency and productivity.

This research finding also confirmed Tarafdar and Vaidya's (2006) assertion which stated that awareness has a positive influence on organisations' inclination when considering new ICT. Whereas, Levy et al. (2002) state that the major factor in increasing investment in IS/IT is the owner's enthusiasm. Again, the finding concurs with Costello et al.'s (2007) argument that owner-managers' personal characteristics are very important in technology

adoption, hence an owner's enthusiasm for technology is a key motivator for the adoption of ICT.

6.1.2.6 Quality of Internet Service

Access to quality internet service has remained a bane in Nigeria and significantly affects the adoption and effective utilisation of ICT in Nigerian SMEs. This is because Nigeria's Internet Service Providers (ISPs) have yet to improve on the quality of service they provide to customers which inevitably discourages a number of SMEs from adopting ICT. Surprisingly, a number of SMEs that participated in the survey are yet to adopt ICT, nevertheless they expressed their awareness of issues surrounding ISPs in Nigeria which inhibits them from adopting ICT. A number of respondents indicated, that they were not willing to waste their resources. Similarly, Arendt (2008) while studying Spanish, Portuguese and Polish SMEs found that the most important barrier indicated by the participants was the lack of ISPs. Despite the unprecedented growth of the internet in Nigeria in the last couple of years, much still needs to be done with regard to affordability of this service. Internet services, both broadband and the more popular dial-up service, are still very expensive and characterised by very slow network.

Although the rapid uptake of mobile internet has assisted in increasing ICT penetration and awareness within the last couple of years, nonetheless much still needs to be done. The ISPs in Nigeria are responsible for providing broadband service, dial-up and mobile phone internet but they are still all very expensive. Many ISPs in Nigeria offer poor services to clients and struggle to stay afloat in their business. Broadband with its faster speeds improves the overall online experiences for both individuals and businesses, encouraging them to explore more applications and spend more time online. In contrast, slow internet connections discourage SMEs from adopting ICT, effectively utilising ICT or further adopting more sophisticated ICT solutions.

Although the liberalisation of Nigeria's telecommunication sector now provides the opportunity for users to choose from a variety of services, there are still problems with the services the ISPs in Nigeria provide to end users. End users face challenges such as unavailability of internet service for several days, very low bandwidth, frequent disconnection, slow connectivity speed and so on which in turn inhibits SMEs particularly from advancing in ICT. Besides, SMEs are generally characterised by very limited funds, hence some SMEs experience difficulties in trying to acquire internet services due to the high cost. Interestingly, this finding supports Kapurubandara and Lawson's (2006) study

which finds that poor internet connectivity affects the adoption of e-commerce in Sri Lankan SMEs. However, it is important to note that broadband connectivity is a key component in ICT development, adoption and use. Consequently, Lawrence and Tar (2010) affirm that broadband accelerates the contribution of ICTs to economic growth, facilitates innovation and promotes efficiency. In addition, the cost of internet access has been described as very high based on the results of the survey which also supports Lawrence and Tar's (2010) findings. These authors note that the monthly connection cost of the internet in most developing countries far exceeds the monthly income of a significant proportion of the population including the case of Nigeria. Chibelushi and Costello (2009) further state that the issue of support provided by service providers can influence the adoption of ICT. Therefore, for Nigerian SMEs to successfully adopt and effectively utilise ICT there is the need for ISPs in the country to improve their services.

6.1.2.7 Lack of Government Support

The lack of government policies/regulations for SMEs is another main inhibitor to the adoption and effective utilisation of ICT in Nigerian SMEs. This is because the role of policy in creating an enabling environment for businesses cannot be underestimated. In Nigeria the policies that support SMEs are not properly implemented and can be described as really inconsistent. The Nigerian government lacks the necessary ICT expertise to formulate and implement a coordinated national ICT policy, hence there is considerable lack of awareness and practical experience. The role of government policies in supporting SMEs has been emphasised by several researchers (e.g. Alam and Noor (2009), Mensah and Benedict (2010)) which helps to validate this finding of the research. For example, Alam and Noor (2009) in their research with Malaysian SMEs stressed that government support has a significant and strong positive link to ICT adoption. The authors further state that both industries and government bodies have a role to play in promoting and supporting small business networking and ICT. Similarly, Apulu and Latham (2009b) comment that the lack of policy/institutional framework affects Nigerian SMEs as there has not been a purposeful policy on ICT for SMEs in the country. The authors also mentioned that a policy on information technology was formulated in 2001 by the Nigeria Information Technology Development Agency (NITDA) but has not been properly implemented. It is vital to note that SMEs, unlike larger organisations, certainly require government support in order to gain a competitive edge. Likewise, Tan and Teo (2000) highlight that government policies are meant to assist SMEs to increase their competitiveness and enable them have greater influence with regard to ICT use. Moreover, Mensah and Benedict

(2010) find that government policies assist in shaping the macroeconomic environment of a country and further determine relevant issues such as policies that could sustain or hinder the growth of SMEs. This implies that a proper government policy for SMEs and ICT would assist in encouraging SMEs that are yet to adopt ICT to begin to adopt.

6.1.2.8 Lack of Support from Banks

Lack of support from banks and their regulations are also inhibitors to the adoption of ICT in a number of Nigerian SMEs. The issue of finance has continued to be a key problem for Nigerian SMEs, despite the implementation of various initiatives or programmes by the government and other agencies to develop the SME sector (see Chapter 3). The literature review confirms that the majority of Nigerian banks do not give out loans to SMEs except for a few agricultural development banks with high lending rates. Moreover, the repayment of these loans is usually a burden as many SMEs often exhaust their profits and sometimes seek extra funds from non-governmental agencies to service such loans. The high lending rates from banks inhibit many SMEs from accessing the necessary funds required for the further development of their businesses, including ICT adoption. Additionally, the microfinance banks that were established to support SMEs in the area of funds have now implemented stringent rules that do not encourage entrepreneurship. The strict capital control by banks has led to the collapse of most SME businesses. This research finding corroborates that of Owoseye (2010) which ascertained that many Nigerian banks do not give loans to SMEs except for agricultural development banks, which usually require collateral such as landed properties, shares and capital. Although the majority of Nigerian SMEs currently are unable to meet the banks' demands, reports claim that there are some ongoing efforts to revive the SME sector in Nigeria. For example, Thisday Live (2011) indicated that in 2010 the Governor of the Central Bank of Nigeria (CBN) disclosed that over 130 billion naira had been released to the Bank of Industries (BOI) for onward disbursement to SMEs via some designated banks (Thisday Live, 2011). Nonetheless, the inability of most SMEs to present the required collateral would continue to be a major deterrent. Again, this finding is in line with that of Arogundade (2010) which also confirms that SMEs in Nigeria lack access to finance. The author described the lack of support from banks as the most visible of all the growth constraints amongst Nigerian SMEs. This could be a reason why most efforts on the part of the Nigerian government seem to have been focused on this constraint. The majority of Nigerian banks are faced with a lack of savings that could possibly result in banks having greater difficulty in supporting SMEs.

6.1.2.9 High Level of Taxation

Multiple taxes inhibit many business operations in Nigeria, especially in the SME sector. Two respondents in the survey indicated that SMEs pay too many taxes and levies which to some extent affects their decisions to adopt ICT and in turn, inhibits them from advancing generally. The respondents further noted that SMEs struggle with limited resources. The finding supports Ihua's (2009) study which considered multiple and high taxes, a significant factor that causes SMEs' failure in Nigeria. Many SMEs pay more than two taxes and this has remained a major issue. In Lagos State, where this research was conducted, a number of the multiple taxes and levies are introduced by the different local governments where illegal levies and fake tax collectors are most rampant. While in cases where the levies are genuinely supported by the state government, some corrupt tax officers usually include unauthorised charges and also extort bribes from taxpayers. Furthermore, the President, National Association of Chambers of Commerce, Industries, Mines and Agriculture, Dr. Herbert Ajayi commented that the issue of multiple taxes in Nigeria has remained unresolved. Dr. Ajayi noted that about 150 taxes and levies are collected in Nigeria, which makes the Nigerian tax situation one of the highest in the world (Umoren and Badmus, 2011). This challenge has created a seriously unfriendly business environment for many investors, including small business owners.

6.1.2.10 Potential for Fraud

Finally, one respondent pointed out that their company is concerned about fraud, hence they are reluctant to adopt ICT. This can be attributed to the company's lack of knowledge on the benefits that are associated with the use of ICT in SMEs. Similarly, a survey conducted by UNCTAD in the year 2004 confirmed that 71% of all countries that were involved in the study identified security concerns such as fraud as the main barriers impeding the use of ICT and e-commerce by customers. Li and Soumi (2007) also identified security risks comprised of the fear of fraud and risk of loss, as inhibitors to e-service adoption. Therefore as Nigerian SMEs continue to adopt ICT, there is a need to consider issues relating to security with utmost priority.

6.2 Level of ICT Utilisation in Nigerian SMEs

The findings of the research reveal a lower level of usage of sophisticated ICT solutions and under utilisation of ICT. Factors such as number of computers, the use of software, hardware and communication applications were used in this research to determine the level of ICT utilisation amongst the SMEs in question. Results from the survey confirm that

65% of the SMEs surveyed are ICT users whilst 35% are considered non-users. Of the 65% that are users, 32% had between one and five computers (desktop and laptop computers) whereas 14% had between six and 10 computers. This indicates that quite a large number of SMEs are currently utilising ICT in Lagos. The survey findings indicate that there are different types of ICT applications being used by SMEs in the region, ranging from software applications to communication applications. However, the majority of the ICT users/adopters mainly utilise the traditional computer-based technologies (see Chapter 3) such as standard office applications and user-friendly tools which include telephone and fax. In fact, the market is dominated by Microsoft based personal computers (PCs). Only a limited number of the SMEs make use of sophisticated communication technologies that allow people and organisations to communicate and share information digitally. More technically advanced software such as finance, HRM, CRM, ERP and custom-based packages are not very popular. In spite of the increasing use of technology in all aspect of lives, some SMEs in Nigeria appear to have ignored the relevance of ICT in doing business, hence have yet to reap the benefits associated with it. This is as a result of some unresolved issues militating against them. Nonetheless, the internet is an exception which the majority of the SMEs make use of but the service is characterised by very slow transmission due to the poor services provided by the different ISPs. Interestingly, findings from the case studies also affirm that SMEs in Lagos are actually utilising ICT but not effectively.

Respondents from the different case studies mentioned a number of challenges that hinder their companies from effectively utilising ICT, despite being recognised as ICT users. This is because the SMEs are faced with some challenges which are similar to those discussed in section 6.1. For example, the lack of steady electricity supply was identified by six out of the seven companies that participated in the interview as a major challenge affecting their effective utilisation of ICT. Another major challenge is the poor internet service offered by ISPs which makes the majority of SMEs that subscribe to internet service unable to realise the expected benefits. In other words, SMEs are of the opinion that they are exploited by the Internet Service Providers. Consequently, some of the employees (except for the managers and IT staff) in the SMEs lack ICT skills so they are incapable of effectively utilising ICT. In some cases employees cannot operate the computer while in other cases some employees assume that ICT is for larger companies thus they become sceptical of the benefits and value of utilising it. Basically, Nigerian SMEs should work towards the successful adoption and effective utilisation of ICT since

ICT has become an indispensable management tool not only for large enterprises but for SMEs as well. At present, empirical findings suggest that Nigerian SMEs are not effectively utilising ICT. Nevertheless, it is important to note that the levels and outcomes of ICT utilisation determine the effects of ICT and its impact on the performance of a company. The researcher was unable to identify supporting literatures relating to this section.

6.3 The Impact of ICT on the Organisational Performance of Nigerian SMEs

ICT plays a very important role in the organisational performance of SMEs as it helps in creating business opportunities and enables SMEs to fully compete with their competitors. Choosing the appropriate ICT applications for a particular business not only assists in cutting down costs but also helps in improving the company's internal processes, enhancing communication and can also provide the opportunity for the company to advertise their products and services online. The research findings show that there are several positive impacts associated with the adoption and effective utilisation of ICT amongst the different SMEs that were selected as cases. This was measured based on value added to the company in terms of productivity after adoption. It is quite interesting to note that some of the impacts or benefits experienced by the case SMEs are in line with the reasons (motivators) behind their decisions to adopt or invest in ICT. This indicates that the SMEs are experiencing their returns on investment. It implies that the SMEs' desires or intended objectives are being fulfilled thus improving their organisational performance. It is of critical importance to investigate the impact of ICT investments on companies' organisational performance in various contexts. This is because ICT is an essential tool that should be aligned with a company's organisational strategy. However, the research findings indicate that the benefits derived from ICT investment vary significantly amongst SMEs but to a large extent depend on the type of ICT investment or combination of investments (i.e. hardware, software and communication applications). The case SMEs in question all identified some benefits that have been derived from their various investments in ICT. This means that the adoption of ICT can provide several wide ranging benefits for SMEs. Some impacts of ICT, identified based on the case studies include the following:

6.3.1 Enhanced Competitive Advantage

The results of the case studies suggest that SMEs currently utilising ICT achieve a great deal of competitive advantage as ICT provides an opportunity for firms to offer a better

quality of service to customers. SMEs endeavour to adopt ICT for the purpose of business enhancement for example, having intranet enhances effective communication between departments and branches of the same company. ICT also helps to enhance a company's interactivity with customers thereby enhancing the overall business of the company. ICT can further be used to enhance knowledge acquisition from external sources. ICT enhances and supports business reform from the usual traditional method of conducting business to an automated method. This corroborates Andersen and Foss's (2005) findings, which state that ICT provides an organisation with a richer endowment of diverse competencies that enhance the organisation's ability to innovate and create strategic opportunity. Andersen and Foss (2005) further comment that the use of ICT can enable computer-mediated communication amongst managers, for instance, in multinational organisations. It can also enhance the internal exchange of rich and tacit information. Such ICT enhanced communication can facilitate the knowledge creation and innovation processes in many enterprises including SMEs. Again, from the literature review, Udo and Edoho (2000) and Ion and Andreea (2008) highlight that ICT contributes to enhancing business operations.

Furthermore, ICT helps SMEs to become more proactive in their approach, innovative and efficient, thereby assisting in improving the core business processes of the organisation. Organisations are able to achieve some level of competitive advantage by providing better customer service with the use of ICT. Pavic et al. (2007) identify that SMEs have the opportunity to achieve a competitive advantage from the advances in ICT through innovation, marketing, efficiency gains, better quality and customer responsiveness. Also, appropriate use of ICT can assist SMEs to gain competitive advantage by reducing costs and improving core business processes. Similarly, the finding confirms Ongori's (2009) study which states that the adoption of ICT would change the way businesses operate in this era of globalisation by changing business structures and increasing competition, by creating competitive advantage for businesses and by changing business operations. There is need for SMEs to build and enhance their organisational processes by having some form of competitive advantage. Having competitive advantage simply means a firm's ability to measure their success relative to that of their competitors and the effective utilisation of ICT is a strategy for achieving such competitive advantage. Again, the finding appears to be in line with Modimogale and Kroeze's (2009) argument where ICT is regarded as a competitive tool for enterprises and if implemented and used correctly, can bring with it many benefits for enterprises. Moreover, Ashrafi and Mutarza (2008) report that ICT deployment helps in establishing the best relationship with customers. All Nigerian SMEs

should consider not only adopting ICT but properly utilising it as well. This is an important approach for businesses to attain their competitive advantage in global markets. In addition, the finding supports Harindranath et al.'s (2008b) study which discovered, while studying SMEs in the UK, that the adoption and use of ICT is widely seen as critical for the competitiveness of SMEs in the emerging global market. Having competitive advantage could be in the area of efficiency since ICT enables a company to become more efficient. Therefore, for Nigerian SMEs to enhance their competitive advantages, they must become effective users of ICT. ICT adoption is increasing globally, offering unique opportunities to companies since it is the current trend amongst organisations all over the world. Nigerian SMEs can set themselves apart from their competitors if they decide to invest in ICT, as this will bring about sustainable competitive advantages.

6.3.2 Improved Efficiency

Insights from the case studies also suggest that ICT brings about efficiency in organisations. The cases confirm that the adoption of ICT has assisted in computerising their companies' records thereby assisting in managing data more efficiently. The adoption and utilisation of ICT has also assisted in shortening lead times in terms of attending to customers' enquiries as the internet, for example, enables companies to access information speedily. In essence, the use of ICT increases the speed of carrying out transactions in organisations. Results from the case studies and literature review (see Chapter 3) ascertained that firms all over the world have continued to make significant investments in ICT aiming to increase efficiency and effectiveness. This finding supports that of Ongori and Migiro's (2010) argument. The authors argue that ICT enhances SMEs, efficiency, reduces costs and broadens market reach, both locally and globally. Likewise, Wolf (2001) conducted a research on SMEs in East Africa and asserts that ICT improves efficiency and increases productivity in different ways including, improving efficiency in resource allocation, reducing transaction costs, and technical improvement leading to the outward shifting of the production function. The research finding further corroborates that of Udo and Edoho (2000) and Ion and Andreea (2008) which states that ICT enhances business operations as well as organisational efficiency. This infers that ICT has a positive impact on organisations' efficiency. Then the inability of Nigerian SMEs to understand or accept the benefits/impacts that are associated with ICT means they risk remaining uncompetitive. Utilising ICT as a means of improving organisational efficiency would enable firms of all sizes to innovate and gain access to new markets. ICT offers prospects for more business transactions due to its fast and accurate means of processing

information. Even though the inability to use ICT deprives unskilled workers of their jobs sometimes, it still increases the efficiency and effectiveness with which businesses operate. The use of digital technologies in running businesses increases productivity, hence a country that is slow in adopting these technologies may not have a fast growing economy. An increase in SMEs' efficiency would assist in developing new products and efficient new business processes.

6.3.3 Improved Communication

ICT provides speedy and convenient means of communication. The case studies reveal that ICT has influenced communication, especially in the areas of sending and retrieving information both within and across organisations. The use of ICT enables SMEs to store customers' details and communicate with them online. This confirms that ICT provides an inexpensive medium for communication, as highlighted in the literature review. The utilisation of ICT enhances communication amongst employees and reduces co-ordination cost. It also provides a speedy medium for communication. For example, having internet service enables an organisation to send information in minutes via email. Also, SMEs can use the intranet to communicate with their other branches. Effective communication in every organisation is crucial to achieving the company's desired outcome. This finding is in line with the findings of other researchers in the literature review chapter (e.g. Konde, 2007; Apulu and Latham, 2009c). Also, Brynjolfsson and Hitt (2000) describe ICT as a tool which helps to cut down the costs of coordination, communication and information processing, and enables efficient service provision at lower cost. Again, Apulu and Latham (2011e) confirm that ICT aids organisational planning and improves organisational communication and flexibility. Additionally, Herselman and Hay (2003) describe ICT as a technology that supports the communication and co-operation of "human beings and their organisations". For example, the use of email and other communication technologies can be used to communicate with customers, informing them about special offers as well as resolving customer complaints. The ability of organisations to communicate effectively with customers would enable a company to attain greater levels of competitive advantage.

6.3.4 Facilitates Information Access

The case studies affirm that the effective utilisation of ICT facilitates organisations access to information. For instance, a case SME specified that the company's manager is able to access the company's account balance anywhere in the world due to the adoption of an accounting software. This means that the company now has access to timely and accurate

information at all times. ICT supports speedy access to and exchange of information, opinions and shared interests. The ability to access and transfer information is critical for every company including SMEs, so as to fully compete in the present economy. This position finds support from existing literatures such as Sahlfeld (2007) and Chiware and Dick (2008). Sahlfeld (2007) asserts that the main importance of ICT to businesses in developing countries is its use in accessing timely and accurate information regarding the supply and demand of products and services in various markets. Whereas Chiware and Dick (2008) affirm that accessing business information has been greatly enhanced with the emergence of various information and communication technologies. ICT allows organisations to store, share and use acquired knowledge and know-how within the firm. Thus, for every SME that intends to stay competitive, it is essential to embrace ICT so as to continue to have access to information.

6.3.5 Improves Planning, Focusing and Forecasting

ICT helps companies to plan ahead, as reported by some interviewees. The telecommunication company (CsD) highlighted that their company is able to use different types of ICT applications in planning the execution of various projects well ahead of time before their actualisation. ICT helps organisations to plan or put together actions that must be practiced in order to achieve organisational effectiveness. For example, the use of ERP software helps in the area of capacity planning, material planning, supply chain planning, procurement planning and so on. Organisations are able to focus on how to minimise risks with the help of ICT. This is because the organisations are able to gain access to information at all times using the internet. Having access to information also assists in managing the financial budget for a particular project and can determine the duration of such project, which is referred to as forecasting. Likewise, ICT supports organisations in the area of database management, production and inventory which together enable companies to effectively plan and focus on key issues or gaps that exist in a particular project, thereby leading to an effective management of companies' businesses. This perception is consistent with the findings of other studies (e.g. Wanger and Brooke, 2007; Apulu and Latham, 2011c) which agreed that some organisations focus on using technology to minimise risks and help in organisational planning, improving organisational communication and flexibility.

6.3.6 Increase Awareness and Profit

The adoption of ICT can play an important role in increasing the awareness of companies' potentials. It also helps to create awareness of the services that are being offered by a particular company. The utilisation of ICT enables some SMEs to feel competent about their services. Likewise, it offers SMEs the opportunity to advertise themselves which in turn enables customers to know about their existence especially if the SME has its own website. ICT is used to inform decision making as well. The literature review confirms that awareness has a positive influence on an organisation's inclination to adopt ICT (Tarafdar and Vaidya, 2006). Insights from the case studies reveal that every organisation aims to make a profit and investing in ICT has enabled some of the case SMEs to increase profit without having to invest in more employees. This may be because companies use ICT to obtain vital information regarding their sales target. A World Bank report (2006) acknowledges that firms which utilise ICT grow faster, invest more, and are more productive and profitable.

6.3.7 Promotes Business Confidence

Insights from the case studies uncovered that the adoption and effective utilisation of ICT brings about business confidence. The ability to conduct businesses online provides some sort of confidence for organisations, especially SMEs. This is because the internet opens a gateway of opportunities for many organisations. Having a website enables companies to share business information, maintain business relationships, and conduct business transactions via various ICT networks. Although a number of SMEs are concerned about the security issues relating to online business activities, quite a number of SMEs have testified that there are advantages associated with them. Furthermore, some SMEs are also concerned about the cost involved in maintaining a website, which gives credence to Poon and Swatman's (1997) argument that it is difficult to ascertain the costs of maintaining a website. Nevertheless, Porter (2001) states that the internet is a critical factor that improves a business's commercial success as well as its operational efficiency. Hence, having a website could assist in improving the overall business process in an organisation. Undoubtedly, not all businesses are going to reap the same benefits from the internet thus there is a need for businesses always to determine if the above advantages outweigh the disadvantages of owning a website. It was observed that a case study decided to computerise their organisational processes, own a website and sets up an ERP system in order to effectively manage their business and use e-mail to efficiently communicate with

customers. This simply means that having a website can be regarded as a strategic tool that gives SMEs a competitive edge and helps in determining a firm's position in the mind of their customers which brings about business confidence.

In spite of the positive impacts of ICT on organisational performance of SMEs, as revealed by the case studies, based on their effective utilisation, there are still a number of factors that were raised by interviewees which negatively affect their organisational performance. Interestingly, a number of the issues described by the interviewees have also been identified in the survey as reasons behind the non-adoption of ICT amongst a number of SMEs. A respondent stated that over-dependence on technology could negatively impact on a company's organisational process as sometimes when there is power outage or internet failure employees are unable to carry out their tasks. System unavailability can create chaos in organisations especially when users rely solely on those systems. For example, if a system is unavailable or users cannot access information even if the system appears to be operational or when a system is slow and cannot work efficiently, it can frustrate end-users. It is wrong to assume that a company would never experience system failure thus it is advised that organisations put measures in place or become conversant with various manual approaches for carrying out tasks, in case there is system failure. The overdependence on technology can have unintended adverse consequences on business operations which is why there is a need for managers especially, to create awareness or enlighten employees of these sorts of issues in all organisations. Companies should adopt strategies that would assist them to effectively deal with system downtime at all times.

One manager suggested the need for software developers to design applications that are not very complex. The respondent urged software developers to design packages that would be easy to use and for the developers to always provide a manual as a guide. It is known that SMEs regularly face the challenge of limited resources, hence after purchasing a software package, some SMEs would find it extremely difficult to hire consultants that can teach them how to use it. This can even discourage some SMEs from purchasing the software package if they realise it would be difficult for them to operate without some form of external support. In addition, the issue regarding ISPs was identified by a respondent who described the present stage of ISP service in Nigeria as elementary due to frequent internet disconnections, as discussed earlier in 6.1.2.6. Besides, some respondents mentioned that ICT infrastructures are energy consuming and also the perilous electricity constraints in Nigeria have made it extremely difficult for some SMEs to effectively utilise ICT.

Other issues, such as the economic situation of Nigeria, were highlighted by a number of interviewees who stated that it affects the overall status of SMEs' businesses in Nigeria. Fuel scarcity also hampers greatly the performance of SMEs as this often makes it difficult for employees to travel from one place to another in order to carry out their businesses. Moreover, most of the generators that are used to generate electricity use fuel/petrol. Nigeria is Africa's largest producer of oil (see Chapter 2) and the importance of fuel to Nigeria's economy cannot be overemphasised, yet the country often fails to meet the demand of its citizens with the required amounts of supplies of petrol thereby making scarcity unavoidable which affects many businesses, especially SMEs. Again, infrastructural inadequacy, such as bad roads, hinders many SMEs especially in the aspect of transferring their products from one location to another. In most cases the drivers spend several hours or days trying to reach their destinations which cause huge delays for small businesses.

The case of corruption in Nigeria was highlighted, since it greatly affects Nigerian SMEs. This comprises illegal payoffs, government officials extorting money, and so on. Some interviewees made mention that often truck drivers are forced to pay bribes to law enforcement agents. This finding conforms to that of Dike's (2005) study which describes corruption as more or less the way of life for Nigerians. Dike (2005) stresses that in Nigeria, it is an acceptable practice to hold out a hand for a bribe. Again, the much emphasised problem with ISPs' poor services and high subscription charges in Nigeria were mentioned by some of the interviewees. Finally, an interviewee from a stockbroking company (CsG) highlighted that the cost of deploying ICT is usually very high and that only a few stockbroking companies deploy ICT to a level close to theirs as at the time of the interview. The reason could be because many SMEs do not meet their sales targets which can discourage most of them from deploying ICT even though SMEs try to manage their limited resources at all times.

6.4 The Extent to which Nigerian SMEs Utilise Sophisticated ICT

The survey results reveal that only a few number of SMEs utilise sophisticated ICT such as ERP (Enterprise Resource Planning), DMS (Data Management System), LAN (Local Area Network) and intranet. The majority of the SMEs in this research utilise mainly traditional-based ICT. In spite of the fact that many SMEs only engage in the traditional-based ICT, as opposed to the advanced or sophisticated technologies, some SME owners who participated in the survey indicated that investing in ICT can add considerable value to

their enterprise. Similarly, responses from the case studies reveal that most SME owners/managers are of the opinion that their organisation has become more marketable and they have been able to increase their customer base as a result of their utilisation of ICT. It is important to note that the case SMEs were not concerned about the need to see an immediate Return on Investment (ROI) after adopting ICT as they were convinced that it would definitely bring about positive changes to their businesses. They also pointed out that the adoption of some sophisticated ICT systems have brought positive changes to their business processes and their operations are now more efficient and effective, resulting in improved customer satisfaction. However, it was observed that SMEs often tend to utilise information and communication technology more as a tool for data processing rather than a means for sharing knowledge.

Although results from the case studies confirmed that six out of the seven SMEs had some form of sophisticated ICT in place, there was a large disparity regarding the level of acquisition of these sophisticated ICT systems or applications. Some SMEs in this research can be classified as high-end ICT users, e.g. the telecommunication company and the retail company, that have integrated sophisticated ICT in their business processes. However, quite a number of SMEs seem to be at the low end of ICT use, employing only traditional ICT applications. In CsA for instance, the sophisticated ICTs that were present at the time of the interviews were ERP, which is mainly used for planning various projects before execution, intranet for effective communication between the various branches of the company, and network servers for fast internet connection; whereas, CsB only utilises Peachtree software to effectively manage the company's accounts as well as Hot soft software for managing the operations of the hotel. There is a CCTV in both branches that helps in monitoring the hotel environments and recording events, should an incident occur that requires investigation. Meanwhile in CsC the only ICT application that is regarded as a sophisticated tool is an accounting package known as Business Soft for managing the company's accounts. CsD is a telecommunication company hence it is expected that the company would utilise some sophisticated ICT systems in order to carry out their tasks effectively. CsD also has a satellite dish and a modem for fast internet connection and utilises some software that assists in averting security threats. However, CsE has no sophisticated ICT in place while in CsF, the only sophisticated ICT is the Peachtree software that helps the company to manage its accounts. CsG, a stockbroking firm, uses Xero software for managing their transactions. It was observed that only one SME had an ERP system in place; however, the majority of the SMEs mainly adopted sophisticated

accounting packages so as to effectively manage their accounts. It was surprising that none of the SMEs had WAN (Wide Area Network) or extranet and again, only CsA had an intranet. In addition, CsD had no sophisticated ICT in place.

It is also interesting to note that despite the low utilisation of sophisticated ICT systems amongst the case SMEs, they were all willing to adopt more sophisticated ICT applications. The case study respondents commented on various reasons as to why their companies were really interested in adopting some sophisticated ICT systems. CsA emphasised that their company is intending to migrate from a medium sized company to a large company but it was impossible to get to that level without the utilisation of more advanced or sophisticated technologies. Yet the company's managing director and some other respondents reiterated that poor internet connection, lack of government policies for SMEs and corruption, remain a bane to the effective utilisation of ICT and adoption of more sophisticated ICT systems in many Nigerian SMEs. With regard to poor internet services, it was confirmed by a respondent that the company had subscribed to six different ISPs due to the very poor service they receive from all of them. CsB also desires to upgrade their systems to more specialised ICT systems, as a way of catching up with the current technological advancements and further assisting the hotel in becoming more efficient thereby reducing redundancies. Nevertheless, the hotel's manager emphasised that cost remains a major issue. The cost involved in acquiring the new systems and the cost implications for training employees is a problem, especially now that Nigerian banks no longer give out loans to SMEs. Meanwhile, CsC wants to adopt a sophisticated system that would help take inventory of all the company's stock but the manager is concerned about the skills inadequacies amongst employees on how to use the new system, since the majority of the company's employees tend to be resistant to change. CsD wants to make their business 100% ICT compliant by adopting very high standard ICT tools, knowing that ICT is dynamic. However, the cost associated with putting the entire systems in place remains a major issue because the company is concerned about the need to train employees which requires finance. Moreover, the cost of generating power is another issue since SMEs usually suffer from a lack of sufficient funds. CsE presently has no sophisticated ICT in place but the manager emphasised that in future, the company would like to adopt some advanced ICT, compared to what is available in the company at the moment, although ignorance (i.e. lack of awareness) amongst employees and lack of power were described as major inhibitors discouraging the company. Consequently, CsF wants to adopt some new inventions from Europe, especially software packages, in future but the

company is also concerned about training its employees due to the fact that some employees begin to search for jobs in larger companies after such training is completed. Besides, most of the employees do not like change and are never ready to participate. In addition, CsG's owner is happy to adopt more sophisticated ICT applications in the near future. However, the decision is dependent on if the company makes enough profit since lack of finance remains its inhibiting factor. Again, a respondent in the company repeated that government policies do not support the small business sector.

Moreover, some employees are not ICT inclined which can discourage many companies from deciding to adopt more sophisticated ICT systems, especially if the management is not ready to train its employees due to the cost involved in hiring consultants to do the job and the usual lack of funds amongst SMEs. It is important to note that the capital required to properly run many of these SMEs is lacking as Nigerian banks are not always available for SMEs. Finally, the cost associated with the provision of electricity in Nigeria is so high that people find it difficult to attend to other issues such as technology adoption. The numerous comments made by the different respondents from the various SMEs simply show that all the companies are willing to adopt more sophisticated ICT applications in order to further develop their business processes but there are several factors that are still militating against them which in turn adversely affect their future plans. However, Ramdani and Kawalek (2007) affirm that sophisticated ICT provides SMEs with opportunities that are largely unexploited.

6.5 Recommendations on How to Enhance ICT Adoption and the Effective Utilisation of Sophisticated ICT Solutions in Nigerian SMEs

The globalisation of businesses has increasingly drawn SMEs into global value chains through various types of cross-border activities. Many entrepreneurs now understand the importance of globalisation, therefore gaining access to global markets has become a strategic instrument for their further development. In Nigeria, there is an urgent need to provide the required enabling environment for the development of SMEs to enable them play a role in the economic transformation of the country. For these SMEs to prosper, they require a conducive business environment, proper policies and regulations, adequate infrastructural facilities, access to short and long-term funding at reasonable rates, among others. As SMEs continue to grow, they require connectivity to export markets and the world economy. Therefore, for Nigerian SMEs to succeed, they require sustainable development that involves concerted effort amongst the various parties concerned, such as

the government, ISPs, banks and other leasing companies, consulting and training firms, as well as local business associations. The responses obtained from the survey and case studies have assisted in identifying some common or fundamental issues that impede against the adoption of ICT, its effective utilisation and the further adoption of sophisticated ICT solutions in Nigerian SMEs. The most prevalent issues that were identified from the survey and case studies are discussed below. Also, recommendations on strategies that can assist in solving the existing problems are presented.

6.5.1 Enhanced Electricity/Power Supply

The lack of a steady electrical supply has remained a major challenge not only to the adoption and effective utilisation of ICT, but also a barrier to the adoption of more advanced or sophisticated ICT solutions, thereby preventing the further development of the SME sector in Nigeria. Nigeria's lack of constant power supply restricts many SMEs from advancing in modern technologies. In Nigeria, it is rare to have uninterrupted power supply for 24 hours as a result of the poor energy situation. Besides, the cost that is associated with individual provision of electricity in Nigeria is very high, therefore many SMEs find it difficult to adopt more sophisticated ICT solutions mainly due to their financial status. Owing to lack of electricity, many Nigerian SMEs spend large sums of money on diesel trying to power their generators. It is important to note that without electricity there could not be proper adoption of ICT. This research finding supports Olatokun's (2006), Akpan-Obong (2007) and Baker (2008) arguments that the lack of electricity supply in Nigeria causes a major hindrance to the diffusion of ICT.

There are limited power distribution networks in Nigeria which has made power shedding a common occurrence in urban areas whereas, in most rural areas people have continued to live constantly in the dark. Akpan-Obong (2007) confirms this, stating that there is no electricity in many rural areas whereas in the towns and cities where there is electricity, the supply is limited. Insights from the literature review and empirical findings from the case studies suggest that insufficient power supply has major implications for Nigerian SMEs and the overall nation. Consequently, the survey report also confirms that the poor state of electricity supply discourages a number of Nigerian SMEs from attempting to adopt ICT. In spite of the abundant hydro resources and natural gas reserves in Nigeria, the state of electricity continues to pose major policy challenges to successive governments, hence there is need for a reformation of the power sector in Nigeria.

In addition, apart from the lack of electricity, there are other infrastructural inadequacies which affect the overall performance of Nigerian SMEs. These include the poor state of many roads in the country. It is important to note that the value of infrastructural facilities in relation to economic growth and development of any country should not be underrated.

6.5.1.1 Success strategy

While many countries have endeavoured to improve their electricity supply, the solution has so far not been pursued successfully in Nigeria. Perhaps the liberalisation of the power sector could be a solution to this problem that has existed for decades. Moreover, based on the rapid increase in population and rising demand for power, there is need for power sector reform in Nigeria. One way the government can achieve this is by replacing the power generating plants as many of these plants are old and some might have been used for over a decade. The government should also endeavour to expand electricity infrastructures as this will help to expand coverage. Appropriate legal and regulatory framework should be put in place that would encourage private sector participation thereby ensuring a level playing field for all investors. This is because power generation is vital for the economic development of any nation. If the electricity supply is made more reliable and efficient, it would definitely support the socio-economic development of the country.

Recently, there has been a report that the Lagos State government has decided to invest in some Independent Power Plants (IPPs) due to the poor electrical situation in the country. The Lagos State Governor states that the massive investment in the IPPs was imperative if the full economic potentials of the State and its numerous citizens are to be fully unlocked for national growth (NBF News, 2011). Power is the most crucial socio-economic issue that the Federal Government has failed to restore over the years. Electricity supply has been unstable which makes Nigerians including SMEs resort to the use of generating sets as an alternative source of energy which has done great damage to the Nigerian economy and the environment in general. According to NBF News (2011), since many small businesses are unable to provide an alternative power source, the irregular electricity supply situation in Nigeria has drastically reduced capacity utilisation, causing damage or loss of equipments and the total demise of many small businesses. Therefore it is vital for the federal government of Nigeria to liberalise the nation's power sector in order to solve the continuing problems affecting it. The liberalisation of Nigeria’s power sector could be the roadmap to an everlasting power sector reform in Nigeria.

6.5.2 Boost SMEs Financial Capacity

Insights based on the literature review and empirical findings of this research have confirmed that the lack of adequate financial resources places significant constraints on the development of SMEs in Nigeria. Despite the fact that a number of SMEs are already utilising ICT including sophisticated ICT applications, finance remains a critical issue to them. Results from the case studies also show that the majority of Nigerian SMEs are willing to adopt not only traditional ICT systems but also sophisticated ICT solutions but inadequate financial resources prevents them from achieving their desire, since ICT is not cheap.

Suliman et al. (2008) confirm that finance is an important issue which guides the adoption and growth of ICT. Also, Alam and Noor (2009) have identified that SMEs' lack of finance is a major constraint to the effective utilisation of ICT. Cook and Nixson (2000) further explain that the role of finance is a critical element for the development of SMEs. Consequently, results from the survey confirmed issues such as training cost (26%), cost (22%) and maintenance (17%) as reasons for the non-adoption of ICT in some of the SMEs. The finding supports Lee and Kim's (2004) assertion which states that even the adopter of ICT is unwilling to upgrade their information systems or to adopt other advanced ICT service applications, as a result of the high adoption cost. The cost of training employees has continued to be a key issue in SMEs. Moreover, SMEs do not develop training plans. In most Nigerian SMEs, there is reluctance amongst owner-managers to invest in training their employees because these owner-managers are afraid of losing trained employees to large companies upon their completion of such training. This validates Arendt's (2008) research amongst SMEs in Portugal, Spain and Poland. In addition, some SME managers who participated in this research stressed that maintaining ICT infrastructures requires a substantial amount of money. In other words, finance should be considered as another critical factor that determines the effective utilisation or adoption of more sophisticated ICT solutions in many Nigerian SMEs.

6.5.2.1 Success strategy

The government should improve the business conditions of SMEs in Nigeria by boosting their capacity. This can be done by strengthening the links between SMEs and banks so as to increase SMEs' access to finance. SMEs need to have support in the lending industries since the current banking rules are unfavourable to SMEs. The government could give support to them by liaising with banks. In an effort to develop the SMEs, the government

in 2003 created a funding scheme for small and medium scale industries, known as the Small and Medium Industries Equity Investment Scheme, where banks were expected to set aside 10% of their profit before tax to finance the sector. However, the scheme was suspended in March 2008 due to complaints about lack of access to the funds and as a result of the high interest rates charged by the banks on the loans. The interest rate charged on loans collected under the scheme is usually very high which makes it very difficult for Nigerian SMEs to access these funds. There is a need for the government to intervene in the situation by providing workable funding schemes for SMEs, knowing full well that SMEs play a vital role in the economic growth of Nigeria. SMEs require affordable long term financing and the government should endeavour to ensure that the scheme is properly monitored in order to achieve the main objectives for its implementation.

6.5.3 Proactive Government Support/Policies for SME sector

The empirical findings suggest that government supportive measures are inadequate. Despite the role of SMEs in the nation's economic development, the policies of the Nigerian government do not support SMEs' development. Government policies, legislation, regulations and laws are vital to the development of the SME sector in any nation. Government support can facilitate or hinder SMEs' development as well as create an environment that can encourage or discourage their adoption of traditional and sophisticated ICT systems, hence Nigerian SMEs require a robust policy.

6.5.3.1 Success strategy

The government has a key role to play in providing an enabling environment to advance the adoption and effective utilisation of ICT amongst Nigerian SMEs. If the government is able to provide the enabling environment for these SMEs, it would encourage small businesses to invest in ICT which will bring about further development in the SME sector. Based on the empirical findings of this research, there is a need for the Nigerian government to put in place strategies that would assist in the development of the SME sector. A number of the case studies' participants acknowledged that present government regulations do not favour of SMEs. Alam and Noor (2009) also confirm that government support has a significant and strong positive link to ICT adoption. The authors stress that industries and government bodies have a role to play in promoting and supporting small business networks and ICT utilisation. Therefore the Nigerian government should introduce a long term policy that would help SMEs in the area of equity finance and simplify the procedure involved in SME loan acquisition. This research further confirms

that of Tan and Teo (2000) who note that government policies are meant to assist SMEs to increase their competitiveness and enable them to have greater influence in their use of ICT. So, the Nigerian government should begin to involve SMEs in policy formulation and execution for maximum effect. SMEs deserve adequate government incentives to enable them to effectively play their role in the economy. This also calls for the need to provide a training ground for indigenous entrepreneurs. There should be collaboration between the government, industries and other developmental organisations on how to further develop the SME sector. Avgerou (2003) confirms that collaboration between the government, industry and other development organisations help in ICT development.

6.5.4 Improve the Quality of Internet Service

Internet services provided by ISPs in Nigeria are characterised by very low bandwidth. The irregular services provided by ISPs in Nigeria are also known for their frequent disconnection and low bandwidth. This is something that has not been identified in previous literatures as a major factor that prevents Nigerian SMEs from effectively deploying ICT. It is one of the most prevalent issue that was raised in this research. Some respondents gave instances where the network goes off most times and could be unavailable for a day or more, which adversely affected their operations as SMEs, especially in the area of sending emails to clients. The network connection provided by these ISPs is usually slow and sometimes, users experience difficulties attempting to browse as well. Until the issue is resolved it will continue to hamper not only on the adoption of basic or traditional-based ICT, but also hinder its effective utilisation as well as the adoption of more sophisticated or advanced ICT solutions. For example no SME would be willing to implement e-business if there is no steady internet connection.

Often, when a server is down or slow, it stops SMEs from conducting their businesses efficiently. The ISPs in Nigeria are still at an elementary stage, as described by a respondent, which is probably a reason why the bandwidth they provide to customers tends to be insufficient and is usually shared amongst many people, making customers pay so much for their services without reaping the expected benefits. Besides, the subscription cost for internet service is very high. The finding corroborates the study of Kapuruandara and Lawson (2006) which identifies that poor internet connectivity, lack of fixed telephone lines for end-user dial-up access and the underdeveloped state of the ISPs were factors affecting the proper utilisation of ICT amongst SMEs in Sri Lanka. Similarly, Arikpo et al. (2009) in their research on the use of ICT in education, also highlighted that high

subscription and infrastructure costs, coupled with the poor quality of service provided by ISPs, act as a major hindrance to the use of ICT. Consequently, the survey respondents confirmed that issues relating to ISPs discourage them from deploying technology. Despite the fact that the SMEs in question were yet to adopt ICT, the majority of them were aware of the poor services provided by ISPs in Nigeria and were not willing to waste their resources. The general poor and unreliable telecommunication network in Nigeria has a tremendous negative impact on ICT adoption in Nigerian SMEs. It adds cost to ICT implementation and maintenance as organisations are sometimes even forced to install their own private networks. Besides, the current telecommunication infrastructures do not allow for high-speed information access and furthermore, telecommunication access is lacking outside urban areas.

6.5.4.1 Success strategy

There is a need for ISPs to improve on the quality of service they provide to their customers, especially in the area of low bandwidth, as this will assist SMEs not only to effectively utilise ICT but also begin to adopt sophisticated ICT applications. Network backbone, fibre-optic backbone for local area networks, amongst others, should be put in place by the government which will help to increase interconnectivity between organisations including SMEs and also increase data access. Although Nigeria is regarded as one of the biggest and fastest growing telecommunications markets in Africa, data access penetration remains low due to the high cost of bandwidth.

There is a need for the government to put in place modern telecommunication infrastructures that would help in increasing internet bandwidth as well as extending internet service to rural areas. ISPs should also extend services to major cities where there is currently no internet presence. In Nigeria, ISPs at the moment operate mainly in Lagos and a few other cities due to the huge capital expenditure involved in setting up operations in other cities and the unavailability of reliable bandwidth in those areas. Once again, ISPs in Nigeria need to accelerate the process of deploying broadband infrastructures in order to solve the existing problems militating against them. The increase in broadband infrastructures will not only contribute to improving broadband penetration but will go a long way to increasing internet access in the country which will substantially increase economic growth. Again, the government should insist that ISP providers reduce the price of bandwidth considerably.

6.5.5 Government must Tackle Corruption

It was described earlier that Nigerian SMEs are characterised by multiple taxes and levies which is probably due to the high rate of corruption in the country. This is because people always want tips before they carry out their duties and so on. Findings from the survey indicate that SMEs pay too many taxes which somehow affect their decision to adopt ICT, as SMEs generally are characterised by limited funds. Ihua (2009) notes that multiple and high taxes are considered to be significant factors that cause SMEs' failure in Nigeria. The level of corruption in Nigeria hampers SMEs' development which in turn, hinders them from reaching their desired targets. Many Nigerian SMEs suffer from this experience since they are unable to provide solutions to the problem of bribery and corruption in the country. Ojukwu (2006) comments that Nigeria is a country where fraudulent activities have affected entrepreneurs and have negatively affect government policies.

Therefore, there is a need for the government to develop proper measures that would assist in stopping these corrupt practices, since they have a significant negative impact on SMEs. A number of factors have been identified as instrumental to increasing corrupt practices in Nigeria. These include the nature of Nigeria's political economy, the weak institutions of government, a dysfunctional legal system and absence of clear rules and codes of ethics (Dike, 2005). The overall culture of governance has also played an important role. Many Nigerian leaders and top bureaucrats set bad examples of self-enrichment or ambiguity over public ethics, thereby promoting lower level officials and members of the public into corrupt practices (Dike, 2005). Informal rules are found to supersede formal ones, thereby causing stringent legal principles and procedures to lose their authority. Hence, bribery and corruption are accepted by many Nigerians as a norm that has been ingrained into the fabric of society (Dike, 2005).

6.5.5.1 Success strategy

The government needs to introduce a tax collection system that can reduce the overall burden of taxation on SMEs and can be done in the form of funding and tax rebate, among others. Also, many Nigerians complain about corruption yet they partake in the act, thereby encouraging corruption directly or indirectly. Corruption blocks a nation's avenue for development. Hence there needs to be a paradigm shift and reorientation as to how the issue of corruption that has eaten deep into the Nigerian system can be resolved. Conferences should be conducted that can bring together stakeholders to discuss the evils of corruption, poor governance and their effects on the socio-economic development of

Nigeria. The Nigerian government and its citizens should join to fight the war against corruption so as to attain reasonable and sustainable levels of growth. Leaders that govern the affairs of the country must be honest, to tackle the issue of corruption. It is recommended that the leadership must demonstrate the willingness to track and punish corrupt officials and citizens that are found wanting or involved in corrupt practices.

6.5.6 Positive Support from Banks

In Nigeria, the economic potentials of ICT are yet to be fully harnessed by SMEs owing to acute lack of resources due to the lack of support from banks. It has been highlighted earlier that many of the banks in Nigeria no longer give loans to small businesses due to their inability to present the required collateral. Banks are afraid that SMEs will never refund their money especially when they have no collateral. The results from the case studies further confirmed that apart from the lack of electricity supply and very poor bandwidth from ISPs which affect many SMEs from adopting and effectively utilising ICT, another major problem is the lack of working capital. Additionally, results based on the survey also established that the lack of support from banks and their strict regulations were reasons for the non-adoption of ICT in a number of SMEs. Nigerian SMEs require pragmatic approaches that will assist in enhancing their business processes with the utilisation of modern technologies. Assisting SMEs to grow will mean more jobs would eventually be created which will help in reducing the level of unemployment in the country. Therefore the Nigerian government should give priority to SMEs just to enable them achieve their set goals. The government must renew their effort in boosting the sector as SMEs have yet to receive the right support that would assist in their advancement.

6.5.6.1 Success strategy

The Nigerian government and financial regulatory authorities should initiate new policies to support the SME sector. Priority needs to the given in the areas of access to capital, capacity building, the adoption and effective utilisation of information and communication technology and infrastructural development, among others. SMEs must be financially supported so that they can advance in their use of technology and expand, thereby meeting the needs of Nigerians. A programme should be initiated to generate significant additional lending services for SMEs especially at this time when commercial banks are reluctant to finance them. Although the reason for the establishment of the microfinance banks was to support SMEs financially, this has yet to be realised due to the strict conditions they offer

to SMEs, especially in terms of the high interest rates. Therefore, the government should also introduce a regulatory policy for microfinance banks. The issue of financial constraints has been discussed extensively based on the results from the survey and case studies therefore should be tackled by the government to reduce the burden facing Nigerian SMEs.

6.5.7 Promotion of Skills and Knowledge in ICT and its applicability

Skills deficiencies and lack of knowledge are other factors which prevent the adoption of more sophisticated ICT solutions in a number of Nigerian SMEs. Most especially, some SMEs refuse to adopt ICT due to the lack of skills amongst its employees. This validates Alam and Noor's (2009) study which identifies the lack of suitable technical and managerial staff with sufficient ICT expertise as a major barrier for SMEs in terms of adopting ICT. The authors establish that SMEs always lack skills amongst their workforce. Similarly, Apulu et al. (2011) in their research involving 25 SMEs, identified skills deficiencies as a contributing factor hindering a number of SMEs that have successfully adopted ICT from further adopting more sophisticated ICT solutions. Therefore, employees' technical skills in SMEs are crucial to the successful adoption and effective utilisation of ICT.

In Nigerian educational institutions, computers are rarely used for teaching purposes as there is a late introduction to the use of computers and internet services. Given that technical skills are required for ICT adoption and utilisation in SMEs, it is vital that SME owners/managers develop strategies that would assist them to overcome the problem of skills deficiency. Similarly, Arendt (2008) comments that the deficiencies that appear in SMEs not only include technical abilities but also management skills. The author further comments that SMEs are reactive in their training activities and they usually do not develop training plans. In other words, it is important for owners/managers to determine their employees' ICT skills as knowledge gained or previous experiences may influence the decision to adopt more sophisticated ICT solutions and effectively utilise them.

Moreover, a manager or owner's prior knowledge of ICT would definitely increase the opportunity of utilising it. Reynolds et al (1994) stresses that small business owner-managers are unlikely to adopt more sophisticated technologies if they are not familiar with the basic ones (see Chapter 3). This means that the lack of skilled employees can prevent Nigerian SMEs from effectively utilising sophisticated ICT solutions in their

companies. Therefore, having skilled employees in SMEs and the requisite ICT knowledge would not only assist these SMEs to adopt more sophisticated ICT solutions, but could also bring about further development in their businesses.

Furthermore, despite the fact that most of the non-adopters who participated in the survey had a positive view about the use of ICT, still they indicated that their lack of knowledge on how to use computers remains a major issue for non-adoption. Insights from the literature review confirm that the lack of knowledge on how to use technology and low computer literacy are factors that can prevent the adoption of ICT (e.g. Costello et al., 2007). Lee and Kim (2004) also state that the lack of technological knowledge amongst employees and their management incapability can be a barrier to the adoption and extension of information systems. The authors further state that some SME managers are concerned about the introduction of ICT, as a result of the fear that their employees might not be familiar with it. Thus, the acquisition of relevant knowledge and technical skills should be regarded as critical success factors in small enterprises.

6.5.7.1 Success strategy

The government has a responsibility to conduct training sessions that will educate SMEs. It should make specific provisions to complement existing initiatives for SMEs (see Chapter 3) with new strategies aimed at upgrading them. Trainings that are sector-specific should be put in place by the government which will focus on the particular needs and practical problems of SMEs. Also, there is need for the government to make ICT related skills and technology form part of the curriculum in educational institutions. It has been identified that lack of knowledge and technical skills limit the ability for SMEs' to adopt ICT applications which can potentially improve their business processes. However, in most cases while SME managers typically have a high-level of understanding of their business and operational processes, they often lack employees with the right experience and skills necessary to utilise ICT, especially the sophisticated ICT solutions. Thus, the government must give selective support to SMEs in order to enhance their core competencies in terms of management and technical skills.

Having the right skills is a part of the strategic requirement for every organisation. Likewise, SMEs owner-managers must ensure they adopt the right skills and identify the roles which the skills will play in making sure they are successful in leveraging ICT. Managers should also be conscious of staff development and training and, if possible, establish a unit to serve such a purpose. Training of staff should be an ongoing process or

should be done on a regular basis. After all, if a company possesses some sophisticated ICT systems but not all the systems are integrated and the employees are not fully trained on how to use the systems, then it means they will be under-utilised. Since ICT proficiency is essential for all companies to effectively participate and engage in modern society, there is a need for owner-managers to conduct training sessions for employees as this will assist in creating awareness of the benefits of adopting ICT in organisations. Besides, continuous national programme to upskill owner managers' knowledge of ICT can play an important role in enhancing the further development of SMEs.

6.5.8 Owner-Manager's Lack of Awareness needs to be overcome

Insights from the survey also suggested that the non-adoption of ICT could be attributed to the lack of awareness amongst owner-managers. Apulu and Latham (2009c) highlight that a number of SME owner-managers in Nigeria are not familiar with the conceptual basis and potential benefits of adopting ICT. Similarly, Chibelushi and Costello (2009) in their research on SMEs in the UK highlight that lack of awareness could hinder SMEs from understanding the potential benefits that are associated with new technologies which can enhance their efficiency and increase productivity. Tarafdar and Vaidya (2006) state that awareness has a positive influence on an organisation's inclination to consider new ICT. This suggests that the owner-managers' personal characteristics play a vital role in technology adoption, as agreed by Costello et al. (2007). Levy et al. (2002) also mention that the major factor in increasing investments in IS/IT is the owner's enthusiasm. Additionally, the survey results clearly suggest that managers with relevant training are more likely to run successful businesses as compared to their untrained counterparts. Many SME owners or managers are still not prepared to face changes in the business environment and plan appropriate changes in their company's use of technology due to their lack of awareness, thereby placing a heavy reliance on external advice and support. Managerial decisions regarding all aspects of ICT are central to the success of a company and cannot be made without the manager being aware of the available options.

6.5.8.1 Success strategy

Owner-managers' of SMEs should set good examples in acquiring ICT knowledge and skills and endeavour to motivate their employees to do the same, since enthusiasm for technology by owner-managers plays a major role in motivating employees to adopt. Consequently, owner-managers' awareness of the potentials of ICT needs to be developed. Therefore, the government should set up programmes that will stress the importance of

managerial skills and knowledge of owner-managers as a way of increasing their awareness of the need to effectively utilise ICT. It is important to note that owner-managers' personal skills and mind-sets would greatly influence the organisational culture of many SMEs. After all, if the owner-manager is unaware of the relevance of ICT it will be difficult to adopt ICT and use it as a tool. Hence, owner-managers should also be enlightened by the government on how to conduct training courses for their employees. To encourage a higher adoption rate of ICT amongst SMEs, the government or relevant authorities must seriously focus on awareness and training programmes for owner-managers. The potential benefits of ICT in SMEs can only be realised if the owner-managers implement them wisely.

In conclusion, it should be noted that the adoption and utilisation of ICT must be aligned to the business. Aligning the ICT strategy with the business strategy will ensure that ICT is used to deliver SMEs' objectives. The strategic alignment of ICT with business strategy can also offer SMEs an opportunity to internationalise and be transformed into knowledge-driven businesses in the present knowledge-based economy. The research has shown that the lack of electricity supply has an adverse effect on SMEs in their quest to utilise sophisticated ICT systems. Also, lack of capital as a result of inadequate support from the government and most especially commercial banks affect many SMEs. Furthermore, poor services provided by ISPs, lack of infrastructural facilities, lack of transparency due to the high level of corruption in the country, lack of ICT skills amongst employees and lack of awareness amongst some owner-managers militate against SMEs' advancements in Nigeria.

6.6 The Proposed Framework for Successful ICT Adoption and Effective Utilisation amongst Nigerian SMEs

So far the discussion has shown that there are more external factors that are currently preventing many Nigerian SMEs from adopting and effectively utilising ICT, including sophisticated ICT solutions which are used for more specific business operations unlike the traditional ICT solutions that are commonly used. The present era of globalisation requires businesses to adopt strategies that would enable them to operate on a global scale and utilise sophisticated or specialised technologies to carry out their operations. Turan and Ürkmez (2010) also state that adopting new or sophisticated ICT is very important as it initiates the movement for a higher quality and competitiveness of SMEs. Hence, in order to work out proper success strategies for Nigerian SMEs in relation to the adoption and

effective utilisation of ICT, there is need to highlight the internal and external factors that affect them. These factors if resolved can assist in the further expansion of their businesses. The findings have also led to the development of a framework which suggests possible success strategies that could assist these SMEs to adopt and effectively utilise both basic and sophisticated ICT solutions since the further development of Nigerian SMEs would play a vital role in the country's economic growth. Meanwhile, other factors that affect the further development of Nigerian SMEs in general, such as the poor state of roads networks, were identified in the research; nevertheless, the framework concentrates mainly on strategies that would increase the take-up of ICT. Table 6.1 summarises the key internal and external factors affecting ICT adoption in Nigerian SMEs.

Table 6.1: Research Findings: Key internal and external factors affecting ICT adoption in Nigerian SMEs

Internal Factors	**External Factors**
Lack of awareness and skills amongst employees	Lack of Electricity supply
Owner-managers' lack of awareness	Inadequate financial resources
	Lack of Government support policies
	Unreliable Internet service
	Corruption
	Lack of support from banks
	Lack of awareness and skills amongst employees

The above table is similar to a framework that was developed by Kapurunbandara and Lawson (2006) which identified factors that affect e-commerce adoption in Sri Lankan SMEs. Initially, the researcher aimed at adapting a model that can be used as a guide in assisting Nigerian SMEs adopt and effectively utilise ICT. Hence, a review was carried out on some ICT adoption models, frameworks and theory (see appendix I). Nevertheless, after conducting the primary research, the researcher realised the need to develop a framework based on some recommendations (success strategies) that would suit the case of Nigerian SMEs. The framework aims to serve as a guide that will help in resolving the issues militating against SMEs in Nigeria, with respect to their adoption and effective utilisation of ICT, including sophisticated ICT solutions. Significantly, the researcher discovered that many Nigerian SMEs do not migrate from one stage to another as proposed in Nolan's model. This is because SMEs leapfrog while trying to upgrade their ICT status and bypass some of the stages. Empirical findings from the case studies reveal that a number of the SMEs moved ahead to adopt sophisticated ICT solutions without effectively utilising

traditional-based ICT, however they ensured the sophisticated technology or system is suitable for their business and could increase customers' satisfaction. Table 6.2 presents a summary of the major problems affecting ICT adoption/utilisation in Nigerian SMEs and further identifies the various parties responsible for ensuring a successful execution.

Table 6.2: Research Findings: Key problems affecting ICT adoption/utilisation in Nigerian SMEs, Recommendations and Responsibilities

S/N	Problem	Strategy for Success/Recommendations	Responsibility
1.	Lack of Electricity Supply	Power sector reform/Liberalisation of the power sector. • Replace old power generating plants with new plants. • Expand electricity infrastructure so as to expand coverage. • Develop legal and regulatory framework to aid private sector participation.	Government
2.	Inadequate financial resources	Boost SMEs capacity. • Strengthen links between SMEs and Banks/Liaise with banks. • Provide workable funding schemes for SMEs. • Offer affordable long term financing. • Ensure proper monitoring of the scheme.	Government
3.	Lack of Government Support Policies	Provide enabling environment for SMEs • Introduce a robust long term policy for equity finance. • Simplify loan acquisition procedure. • Involve SMEs in policy formulation and execution. • Provide adequate incentives. • Train indigenous entrepreneurs. • Collaborate with industries.	Government
4.	Unreliable internet service	Increase bandwidth to enhance internet service • Extend services nationwide. • Reduce the price of bandwidth. Build new telecommunication infrastructures.	Internet Service Providers Government
5.	Corruption	Introduce new tax collection system • Ensure tax rebate.	Government

		• Conduct conference/seminars on negative consequences of corrupt practices. • Actively legislate and act against corrupt practices. • Track and punish corrupt government officials and citizens involved in the act.	
6.	Lack of Support from Banks	Initiate new policies for SMEs support. • Enable access to capital. • Improve capacity building • Improve infrastructural development. Introduce a regulatory policy for micro finance banks. • To support SMEs financing. • To reduce interest rates.	Government & Financial authorities Government
7.	Lack of awareness and skills amongst employees	Conduct training sessions for employees in SMEs. Establish training initiatives. • Conduct sector specific trainings. • Focus on specific needs of SMEs. • Enhance core competencies to aid management and technical skills. • Ensure ICT related skills and technology are included in institutions' curriculum. Owner-managers to identify the skills required for success. • Conduct staff development training.	Government Owner-managers
8.	Owner-managers' lack of awareness	Acquire ICT knowledge and skills and inspire employees to do the same. Increase awareness of the potentials of ICT. Initiate programmes to increase owner-managers' awareness. • Emphasise the importance of managerial skills and knowledge on ICT adoption and utilisation. • Teach owner-managers how to conduct training sessions for employees.	Owner-Managers Government

6.6.1 A Framework for ICT Adoption and Effective Utilisation

In the light of the factors affecting the adoption, proper utilisation and further adoption of sophisticated ICT solutions in Nigerian SMEs, a framework has been developed as shown in figure 6.1 below. This suggests possible strategies that can assist in the successful adoption and utilisation of sophisticated ICT solutions within Nigerian SMEs, since SMEs' development is an essential element in the growth strategy of Nigeria's economy. From the framework, it can be deduced that there are three major entities that can change the status of Nigerian SMEs. The government's support will definitely encourage non-adopters to begin to adopt basic or traditional-based ICT solutions, while support from the internet service providers will assist these SMEs to effectively utilise ICT. Finally, support from owner-managers will inspire employees and can also lead to the adoption of sophisticated ICT solutions.

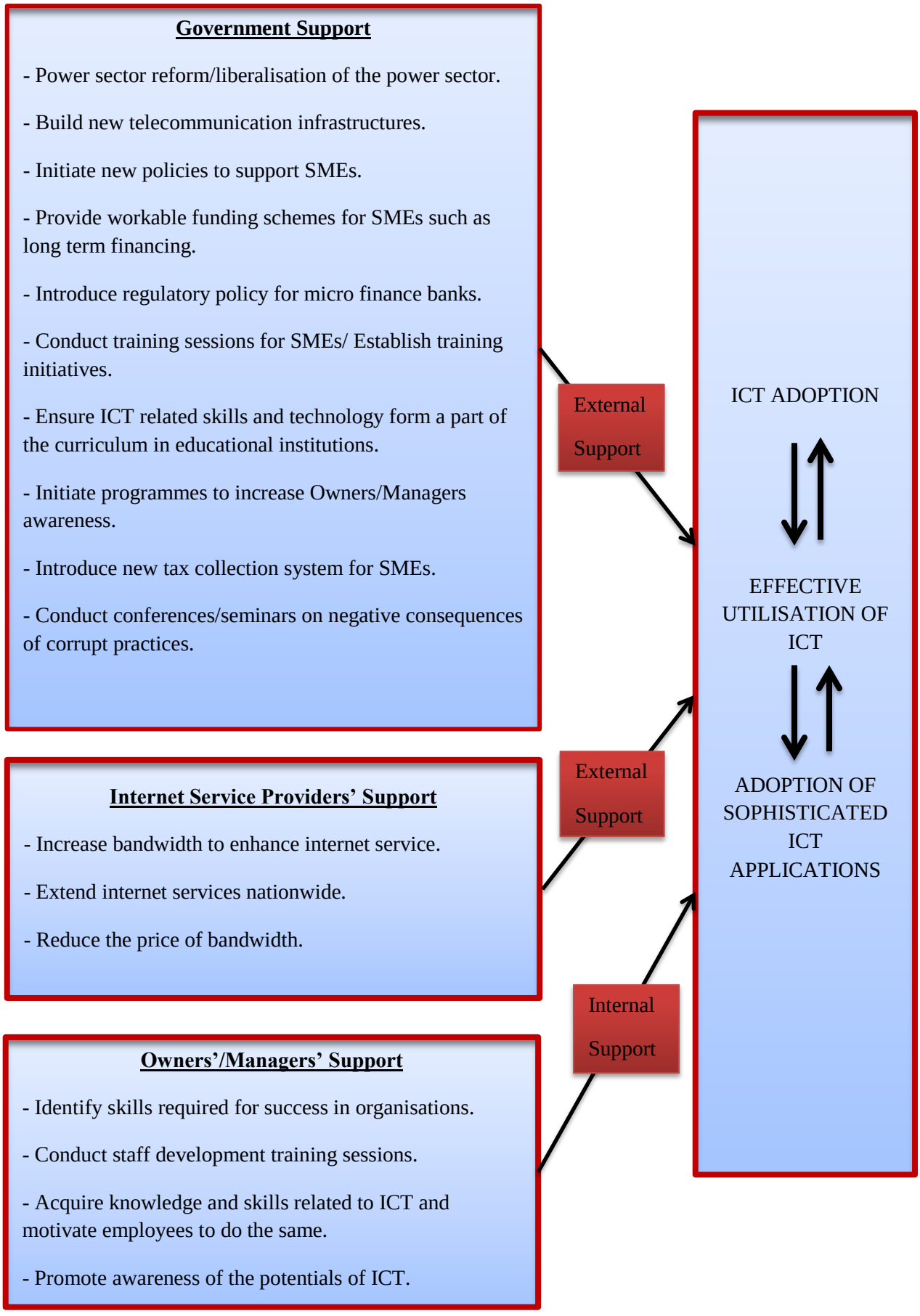

Figure 6.1: The Framework

The following table provides references to the framework components given in figure 6.1.

Table 6.3: Framework components (Reference/Source)

	Framework Components	**Reference/Source (within the thesis)**
Government Support	Power sector reform/liberalisation of the power sector.	Section 6.5.1.1
	Build new telecommunication infrastructures.	Section 6.5.4.1
	Initiate new policies to support SMEs.	Section 6.5.3.1
	Provide workable funding schemes for SMEs such as long term financing.	Section 6.5.2.1
	Introduce regulatory policy for micro finance banks.	Section 6.5.6.1
	Conduct training sessions for SMEs/ Establish training initiatives.	Section 6.5.7.1
	Ensure ICT related skills and technology form a part of the curriculum in educational institutions.	Section 6.5.7.1
	Initiate programmes to increase Owners/Managers awareness.	Section 6.5.8.1
	Introduce new tax collection system for SMEs.	Section 6.5.5.1
	Conduct conferences/seminars on negative consequences of corrupt practices.	Section 6.5.5.1
Internet Service Providers' Support	Increase bandwidth to enhance internet service.	Section 6.5.4.1
	Extend internet services nationwide.	Section 6.5.4.1
	Reduce the price of bandwidth.	Section 6.5.4.1
	Identify skills required for success in organisations.	Section 6.5.7.1

Owners'/Managers' Support	Conduct staff development training sessions.	Section 6.5.7.1
	Acquire knowledge and skills related to ICT and motivate employees to do the same.	Section 6.5.8.1
	Promote awareness of the potentials of ICT.	Section 6.5.8.1

6.4 Summary

There is a need for Nigerian SMEs to embrace the state-of-the-art technologies in order to penetrate the international markets and remain competitive. SMEs are vital to the Nigerian economy, therefore the government and all other groups should assist in resolving the challenges preventing their advancement in ICT, now that ICT has become indispensable for all kinds of businesses. This chapter has presented a framework that will facilitate a successful adoption and effective utilisation of ICT amongst Nigerian SMEs, which can also help in the deployment of more sophisticated ICT solutions. The framework depicts empirically, contextual factors that prevent the implementation or upgrade of ICT use in Nigerian SMEs. The chapter also determined organisational benefits that are associated with the utilisation of ICT as well as motivators for SMEs' decisions to adopt ICT.

However, the identified challenges, if properly addressed, could enable the further development of the SME sector in Nigeria. This will not only assist in increasing their competitiveness on a national level but also enable them to compete worldwide. Efforts should be made to reposition the power sector in order to improve the electricity supply in Nigeria. Nigerian SMEs will benefit from the effective utilisation of ICT only if the government implements initiatives that would help to establish a legal regulatory framework which will legitimately aid the adoption and effective utilisation of ICT amongst the SMEs. The regulatory framework would assist in eliminating factors affecting ICT adoption and thus, create a conducive business environment for Nigerian SMEs. Overall, in answering the research questions, the research findings concur with some findings in the literature review but call for a better understanding of factors affecting ICT adoption amongst SMEs in Nigeria, which are somehow unique. More importantly, SMEs

should be given access to low interest rates and long-term loans by the government so they can have sufficient funds to use.

CHAPTER 7 – RESEARCH VALIDATION

7.0 Introduction

This chapter discusses the validation of the research framework developed for SMEs in Nigeria. The framework was designed based on the research findings and recommendations put together as a guide to assist in increasing the adoption and effective utilisation of ICT in Nigerian SMEs. Creating an enabling environment and enhancing the capacity of SMEs by encouraging them to adopt ICT is necessary if any significant improvement in the sector is to be realised.

Having developed a framework, there is a need to test its validity before it can be more widely disseminated. The aim of the validation process is to determine whether the research findings and recommendations used for developing the framework are sound and also, to establish whether these findings and recommendations are reliable. Validation is vital because it reveals the potential objectivity and reliability of the research. Furthermore, validation provides a solid background against which the research findings could be generalised. The next section provides a general discussion of the concept of validation then the method adopted for undertaking the validation exercise. Subsequently, the details involved in each of the validation procedures are discussed.

7.1 The Concept of Validation

Validation is a key part of the model/framework development process which increases confidence in the model/framework and makes it more valuable (Kennedy et al., 2005). Winter (2000) argues that "validation" is not a single, fixed or universal concept, but rather a contingent construct, inevitably grounded in the process and intentions of particular research projects and methodologies. Validity determines whether the research truly measures that which it was intended to measure or how truthful the research results are (Golafshani, 2003). The concept of validation has several meanings in the different stages of the research processes especially the conceptual, methodological and empirical domains (Brinberg and McGrath, 1985). In the conceptual domain, validation can be established by assessing the effectiveness, internal consistency, testability and adaptability of the concepts used. In the methodological domain, it would be expected that efficiency, rigour, unbiasness and explicitness would prevail. While in the empirical domain, it would be expected that the research is beneficial or relevant in terms of any potential practical application. The concept of validity is described by a wide range of terms in qualitative

research. This concept is not a single, fixed or universal concept, but "rather a contingent construct, inescapably grounded in the processes and intentions of particular research methodologies and projects" Winter (2000 in Golafshani, 2003). Although some qualitative researchers have argued that the term validity is not applicable to qualitative research, at the same time they have realised the need for some kind of qualifying check or measure for their research (Golafshani, 2003).

Bahri (2009) also states that the quality of qualitative research is measured by the validity of the findings. Furthermore, Brinberg and McGrath (1992) advocate that any attempt at validating a research process should be aimed at integrating the three domains and a possible methodology for assessment is for the researcher to strive towards value, correspondence (or fit) and robustness. Value, in essence, deals with the worthiness of the research, while correspondence is the degree at which the features of the relations in the various domains match or fit together. Robustness deals with testing the consistency of the empirical findings through replication, convergence and differentials (Walliman, 2001). In other words, robustness deals with the wider issue of generalisability or, as is often referred to as external validity (Brinberg and McGrath, 1985; Bailey, 1987 and Blaikie, 2003). Validity can be divided into two main components: internal and external and the technique has been successfully employed by many researchers (e.g. Proverbs, 1998; Xiao, 2002; Ahadzie, 2007; Ankrah, 2007; Egbu, 2007 and Ikpe, 2009).

7.2 Model/Framework Validation

The validation of a model/framework is the process of confirming whether the proposed model/framework is appropriate, especially in the light of the purposes of the investigation (Frees, 1996). Egbu (2007) describes the validation of a model/framework as the process of assessing the ability of the model/framework to do what it sets out to achieve. This process attempts to ensure that the model/framework represents the characteristics of the general population and is not peculiar to the samples used in its estimation (Hair et al., 1998). According to Ankrah (2007), the validation process thus seeks to assess the extent to which the models predict the outcomes in terms of performance above or below average.

The extent to which the findings of the research can be trusted depends on the process of validation undertaken to confirm or unconfirm the research findings. The two major components of validation (internal and external) were used to validate the framework and are described in later sections. The framework was derived mainly from empirical data

analysis of the qualitative research in this study. Having developed a framework showing how the adoption and effective utilisation of ICT can be enhanced in Nigerian SMEs, there is a need to test the validity of the results to the wider population (SMEs).

7.2.1 Selection of the Participants for Validation

Three options were considered for carrying out the validation: (i) focus groups (ii) interviews and (iii) postal surveys. The use of focus groups or interviews were not selected due to time and cost constraints, leaving the postal survey as the most appropriate option. Problems associated with postal surveys such as the restrictive nature of the questionnaire and lack of opportunity to clarify respondents' doubts were overcome by carefully designing the questionnaire and including with it a copy of the research framework to clarify any misunderstandings the respondents may have had. As an exploratory research, it was important to validate the findings with stakeholders in the SME sector, to determine if the findings were valid and the recommendations useful, based on their experiences.

For this reason, a covering letter was sent to the participants in the 66 companies that were initially selected for the purpose of the research, including participants who participated in the case studies, requesting their kind assistance in the validation exercise and restating the purpose of the research. A questionnaire was also attached to the framework highlighting what was expected of them for the validation process. This was sent out via post and email to the 66 SMEs and reminders were also made over the telephone. The use of the previous participants is based on their prior involvement in the earlier survey/interviews which makes them familiar with the research and would ensure a good response rate. Taking one's findings back to the subjects being studied where the people can verify the findings, has been argued by Silverman (2006) as being that one can be more confident of their validity. This method is known as respondent validation (Silverman, 2006).

Also, validation of the framework helps to ensure that the research has actually identified key factors affecting ICT adoption amongst Nigerian SMEs and has sought to assess the extent to which the framework endeavours to resolve the issues facing them. That is, if the framework has provided accurate suggestions on how the factors affecting Nigerian SMEs with respect to their adoption and effective utilisation of ICT can be addressed. The next section therefore describes the validation process and the conclusions drawn from the findings. This would also help to predict if the usefulness of the research outcome was about, or above, average. The following sections provide a description of the methods adopted for the validation exercise.

7.3 Methods Adopted for Validation

Two methods were adopted for the validation exercise which includes external and internal validation.

7.3.1 External Validation

Brinberg and McGrath (1985) state that the essence of external validation is to gain confidence in the findings and what they mean. It is about ensuring the robustness of the research and about assessing its generalisability (Rosenthal and Rosnow, 1991; Fellows and Liu, 1997). Eisenhart and Howe (1992) argue that external validity or generalisability is not a crucial issue for qualitative case studies (Maxwell, 1992). However, it is incorrect to assume that qualitative case studies lack generalisability. The purpose of qualitative research is to generalise the findings analytically whereby the researcher generalises a particular set of results to some broader theory (Healy and Perry, 2000).

External validity was achieved in this research by comparing the findings with similar findings from previous studies (Eisenhardt, 1989). Participants who took part in the first and second phases of the research were invited to share their opinions on the research findings and recommendations in a questionnaire survey. Although the sample size used for this validation exercise is relatively small, the feedback received is generally encouraging and suggests that the research findings and recommendations have the potential of being well received. The outcomes suggest that the findings and recommendations are useful in terms of stimulating the advancement of ICT in Nigerian SMEs. The feedback also creates assurance that the developed framework could assist the government, owners/managers as well as other stakeholders in increasing the adoption and effective utilisation of ICT in Nigerian SMEs. The tables below present a summary of the results that were obtained from the participants who responded to the questionnaire. Indeed, results from the questionnaire and some of the positive recommendations made by a number of the participants acknowledged that the framework is useful and would serve as a detailed guide for the major groups that are involved with SMEs (e.g. government, owners/managers, ISPs).

7.3.2 Participants' Response

Of the 66 SMEs who were sent questionnaires for the validation, 52 responded. Out of the 52 responses, 45 were made up of SMEs that participated in the initial survey and

interview comprising a combination of users and non-users of ICT. The other seven responses were obtained from the last SMEs which were used as the research case studies. Amongst the seven SMEs that were used as case studies, it is important to note that 26 people took part in the initial data gathering stage (see table 5.19). However, at the time of the validation exercise, only 18 of them participated. The remaining eight participants were either not available or were no longer working for their respective companies.

The data was analysed using SPSS 16.0 to determine the frequency and percentage to which respondents at least agree to the research outcome (see appendix G). The majority of the participants were in favour of the outcome, indicating that the framework is a positive contribution to the further development of Nigeria's SME sector. In addition some of the respondents provided their comments about the framework which has been incorporated in this chapter. All the results received were, to a large extent, positive as shown in the tables 7.1 and 7.2 below.

Table 7.1: Validation of research findings from case studies comprising seven SMEs (Frequency-Percentage)

Item (Question)	**Strongly Disagree (1)**	**Disagree (2)**	**Neutral (3)**	**Agree (4)**	**Strongly Agree (5)**
Electricity	0(0%)	2(11.1%)	1(5.6%)	3(16.7%)	12(66.7%)
Finance/Training Cost	0(0%)	1(5.6%)	2(11.1%)	7(38.9%)	8(44.4%)
Government Policies	1(5.6%)	3(16.7%)	2(11.1%)	8(44.4%)	4(22.2%)
Internet Service	0(0%)	1(5.6%)	1(5.6%)	10(56.6%)	6(33.3)
Tax and Levies	0(0%)	4(22.2%)	4(22.2%)	6(33.3%)	4(22.2%)
Bank's Support	0(0%)	1(5.6%)	2(11.1%)	7(38.9%)	8(44.4%)
Infrastructural Inadequacies	1(5.6%)	1(5.6%)	1(5.6%)	6(33.3%)	9(50%)
Skills and Knowledge	0(0%)	3(16.7%)	1(5.6%)	11(61.1%)	3(16.7%)
Owners'/Managers' Awareness	0(0%)	1(5.6%)	3(16.7%)	13(72.2%)	1(5.6%)

Note: Total number of respondents =18

Table 7.2: Validation of research findings from 45 SMEs comprising ICT users and non-users (Frequency-Percentage)

Item (Question)	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
Electricity	0(0%)	0(0%)	1(2.2%)	23(51.1%)	21(46.7%)
Finance/Training Cost	0(0%)	0(0%)	0(0%)	23(51.1%)	22(48.9%)
Government Policies	0(0%)	1(2.2%)	3(6.7%)	20(44.4%)	21(46.7%)
Internet Service	0(0%)	0(0%)	0(0%)	17(37.8%)	28(62.2)
Tax and Levies	0(0%)	7(15.6%)	8(17.8%)	20(44.4%)	10(22.2%)
Bank's Support	0(0%)	2(4.4%)	5(11.1%)	16(35.6%)	22(48.9%)
Infrastructural Inadequacies	0(0%)	0(0%)	5(11.1%)	13(28.9%)	27(60%)
Skills and Knowledge	0(0%)	0(0%)	1(2.2%)	11(24.4%)	33(73.3%)
Owners'/Managers' Awareness	0(0%)	0(0%)	1(2.2%)	11(24.4%)	33(73.3%)

Note: Total number of respondents = 45

The responses received with respect to the research findings indicate that the majority of the respondents at least agree or strongly agree to the findings. Overall, the research findings were to a large extent accepted by all the respondents except for the finding relating to multiple taxes and levies where just over 50% of respondents agreed with the finding. Results with respect to the research recommendations are also presented in 7.3 and 7.4 below:

Table 7.3: Validation of research recommendations from case studies comprising seven SMEs (Frequency-Percentage)

Item (Question)	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
Liberalisation	1(5.6%)	0(0%)	1(5.6%)	5(27.8%)	11(61.1%)
Regulatory Framework	0(0%)	2(11.1%)	2(11.1%)	6(33.3%)	8(44.4%)
Nationwide Internet Service	0(0%)	3(16.7%)	1(5.6%)	9(50%)	5(27.8%)
Telecommunication Infrastructure	0(%)	3(16.7%)	1(5.6%)	6(33.3%)	8(44.4%)
Funding Schemes	0(0%)	3(16.7%)	4(22.2%)	6(33.3%)	5(27.8%)
Liaise with Banks	0(0%)	0(0%)	0(0%)	13(72.2%)	5(27.8%)
Reduce Interest Rates	0(0%)	1(5.6%)	1(5.6%)	8(44.4%)	8(44.4%)
Taxation	1(5.6%)	2(11.1%)	5(27.8%)	5(27.8%)	5(27.8%)
Tackle Corruption	2(11.1%)	0(0%)	2(11.1%)	5(27.8%)	9(50%)
Training	2(11.1%)	0(0%)	2(11.1%)	5(27.8%)	9(50%)
ICT Skills in Institutions	0(0%)	0(0%)	1(5.6%)	2(11.1%)	15(83.3%)
Framework valid for Government	1(5.6%)	0(0%)	5(27.8%)	9(50%)	3(16.7%)

Framework valid for Owners/Managers	1(5.6%)	0(0%)	3(16.7%)	7(38.9%)	7(38.9%)
Framework valid for other Stakeholders e.g. ISPs	1(5.6%)	2(11.1%)	4(22.2)	7(38.9%)	4(22.2%)

Note: Total number of respondents =18

Table 7.4: Validation of research recommendations form 45 SMEs comprising ICT users and non-users (Frequency-Percentage)

Item (Question)	**Strongly Disagree (1)**	**Disagree (2)**	**Neutral (3)**	**Agree (4)**	**Strongly Agree (5)**
Liberalisation	0(0%)	3(6.7%)	10(22.2%)	22(48.9%)	10(22.2%)
Regulatory Framework	0(0%)	0(0%)	6(13.3%)	16(35.6%)	23(51.1%)
Nationwide Internet Service	0(0%)	2(4.4%)	10(22.7%)	16(35.6%)	17(37.8%)
Telecommunication Infrastructure	0(0%)	3(6.7%)	3(6.7%)	21(46.7%)	18(40%)
Funding Schemes	0(0%)	0(0%)	2(4.4%)	11(24.4%)	32(71.1%)
Liaise with Banks	0(0%)	1(2.2%)	6(13.3%)	17(37.8%)	21(46.7%)
Reduce Interest Rates	0(0%)	1(2.2%)	8(17.8%)	12(26.7%)	24(53.3%)
Taxation	0(0%)	2(4.4%)	8(17.8%)	19(42.2%)	16(35.6%)
Tackle Corruption	0(0%)	0(0%)	1(2.2%)	9(20%)	35(77.8%)
Training	0(0%)	0(0%)	1(2.2%)	13(28.9%)	31(68.9%)
ICT Skills in Institutions	3(6.7%)	0(0%)	5(11.1%)	27(60%)	10(22.2%)
Framework valid for Government	3(6.7%)	0(0%)	5(11.1%)	27(60%)	10(22.2%)
Framework valid for Owners/Managers	4(8.9%)	0(0%)	3(6.7%)	22(48.9%)	16(35.6%)
Framework valid for other Stakeholders e.g. ISPs	5(11.1%)	1(2.2%)	12(26.7%)	18(40%)	9(20%)

Note: Total number of respondents =45

As with the responses received regarding the recommendations put forward to assist Nigerian SMEs, they were all accepted by the respondents.

The results from the participants suggest that the findings and recommendations are valid. Furthermore, as can be observed from the tables, most of the respondents agreed that the framework will serve as a guide for the government to boost SMEs' capacity, with 66.7% from the case study SMEs and 82.2% from the other categories of SMEs. In terms of the framework assisting SME owners/managers in increasing the adoption and utilisation of ICT including the take-up of sophisticated ICT applications, 77.8% and 84.5% agreed respectively. Finally with respect to other stakeholders such as ISPs, it was observed that 61.1% of the participants from the case studies and 60% of the other participants that were involved in the survey and initial interviews agreed that the framework would also serve as

a guide for other stakeholders. This suggests that the research would be regarded by practitioners as a very useful tool for decision making as more than 50% of the participants' opinions were in favour of the research findings. This represents a positive contribution to the body of knowledge.

Respondents were requested to make their own assessments of the research framework and also offer suggestions on how the framework could be improved. While many of the respondents re-emphasised that the research findings have the potential for increasing the take up of ICT in Nigerian SMEs because of its capability of assisting the government, SME owners/managers as well as other stakeholders such as Internet Service Providers, there were a few interesting assessments made which are worthy of note:
"Well-done on your research. It is very relevant to the improvement of our SMEs as regards ICT. I couldn't have thought anything new/better. I am already enlightened by your points. Once again, well-done!" [Owner-Manager].

"I think your research findings and recommendations are very important and will be really useful in the country" [Branch-Manager].

"To add to the foregoing, I think the apathetic nature of the Nigerian government towards ICT development in the country is also a major hindrance to ICT gaining a foothold in the country. The government's attitude towards ICT development has been at best lackadaisical. While playing lip service to the advancement of ICT in the country their body language so to speak, portrays an indifferent attitude. However, I hope the government considers a number of recommendations you have provided in your research and use it as a guide to increase the take up of ICT within SMEs in this country" [Managing Director].

Also, a few suggestions were made by some of the participants:

"Issues that need to be resolved first include literacy level, standardization consciousness and mental development of youths to develop their entrepreneurial capabilities as against depending on working for people" [IT officer].

Another respondent re-emphasised the need for power sector reform, which has been recommended in this research:

"As for the power sector, there need to be lots of reform and the public should be involved in making the decision as they are the ones mostly affected. There should be a regulatory body that should enforce whatever reforms and decision are taken with legal aid and back up" [Admin-Manager].

A respondent also notes that:

"The framework may not be capable of assisting stakeholders such as the Internet service providers but would assist especially the government and the owners/managers of SMEs" [Head of IT].

Furthermore, one respondent indicated that the lack of awareness amongst employees was a key issue; however, this has been identified in the research and it has been recommended that the government should put in place enlightenment programmes that would educate owners/managers and these owners/managers should in turn, train their employees.

"The government liaising with banks will not solve the problem because in my opinion, funding is not the major problem facing SMEs with respect to ICT. The main issue is lack of awareness. Therefore, the government and business owners should focus on educating the people/employees about information and communication technology and its relevance in today's world" [IT-Manager].

Finally one respondent suggested that:

"Nigerian SMEs should see ICT as a welcome development and take advantage of it by acquiring its necessary skills and not always wait for the government for support" [Secretary].

External validation has been used to substantiate the research findings from the participants while internal validation has been applied to the conceptual and methodological domains as discussed below.

7.3.3 Internal Validation

Rosenthal and Rosnow (1991) define internal validity as the degree of validity of statements made about whether X causes Y – the primary concern being to rule out plausible rival hypotheses. Egbu (2007) notes that internal validation seeks to outline the strength of the model/framework as well as assess the literature search. Internal validity concerns the credibility of the inferences made from the data while external validity

concerns the generalisability of the findings (Eisenhardt and Howe, 1992; Kirk and Miller, 1986). Interestingly, whilst researchers agree that both internal and external validation are important for validating a research process, there are limited literatures that describe in detail what form the internal validation process should take (e.g. Fellows et al., 2002).

In order to achieve internal validity, this study has adopted several measures. The most important measure was feeding back the transcripts and findings to the informants or participants (Easterby-Smith et al., 1991) which served two purposes. First, it enabled the participants to check the accuracy of the transcripts, thus enhancing the descriptive validity of the study (Maxwell, 1992), i.e. the accounts of the informants are factually correct. Second, it presented an opportunity to the informants to provide feedback to the researcher's interpretation of their adoption and use of ICT. The feedback has enhanced the study's interpretive validity (Maxwell, 1992).

Some of the findings of this research have been published in a number of international peer reviewed journals and conference proceedings. It is important to note that most of the key arguments and findings of the research were supported by comprehensive literature. Even where divergent findings were reported, these were considered in the light of the extensive literature supporting the alternative views.

A total of five journal papers have been published and one is currently under review. Disseminating the research findings to the academic community through the publication of articles in international academic journals and conference proceedings involved a review and assessment of the validity of the research and its findings by independent referees. Xiao (2002) states that peer review in this manner provides an opportunity for the methodologies, meanings and interpretation of the research to be questioned. Runeson and Loosemore (1999) refer to this dissemination process as a process of critical inquiry which is meant, in theory, to provide an informed, fair, reasonable and professional opinion about the merits of the research. Fenn (1997) has observed that peer review is used as the gold-standard throughout academia in the UK. Feedback from such a process helps to enrich research work and potentially improves its findings (Alkass et al., 1998). In all cases the referees provided feedback outlining the basis of their decision, often raising issues which range from trivial to fundamental and were incorporated in this research to improve its validity. The journals targeted so far are TMC Academic Journal, International Journal of

Business and Management, Journal of Systems and Information Technology, International Business Research, International Journal of Management Practice.

Six conference papers have been published and four presentations have been made. The papers have been presented at the 32nd Institute for Small Business and Entrepreneurship (ISBE) Conference (2009), UK, the UK Academy for Information Systems (UKAIS) Conference (2010), UK, 2nd International Conference on Information Management and Evaluation (2011), Canada and the Twelfth Annual Global Information Technology Management Association (GITMA) World Conference (2011), USA. The remaining two conference papers have been published in the UK Academy for Information Systems (UKAIS) Conference (2009), UK and the International Conference on ICT for Africa (2011), Nigeria.

The remarks and feedback from the academic community during the presentation and review that have been incorporated in the research and into this thesis, have significantly improved the research, making the findings more robust and reliable, as argued by Xiao (2002). Acceptance of the articles for publication indicates that this research is scholarly and academically valid. However, the dissemination of the research findings with respect to academic validity is on-going with intended papers aimed at focussing on specific and distinct aspects of the research findings. The table below presents a list of journal and conference papers that have been published.

Table 7.5: Published Journal and Conference Papers

No	Authorship	Year of Publication	Type of Publication	Remarks
1.	Apulu and Latham	2009a	Conference Paper	Published
2.	Apulu and Latham	2009b	Conference Paper	Published
3.	Apulu and Latham	2009c	Journal Paper	Published
4.	Apulu and Latham	2010	Conference Paper	Published
5.	Apulu and Latham	2011a	Conference Paper	Published
6.	Apulu and Latham	2011b	Conference Paper	Published
7.	Apulu and Latham	2011c	Journal Paper	Published
8	Apulu and Latham	2011d	Conference Paper	Published
9.	Apulu and Latham	2011e	Journal Paper	Published
10.	Apulu, Latham and Moreton	2011a	Journal Paper	Published
11.	Apulu and Ige	2011	Journal Paper	Published
12.	Apulu, Latham and Moreton	2011b	Journal Paper	Accepted

The significance of the papers cited lies in their use in supporting the main findings presented. A major characteristic of all the papers cited is that the main findings of the research were supported by comprehensive literatures. The considerable volumes of literature provide evidence of academic validity.

7.4 Summary

This chapter reports on the validation of the research findings, recommendations and framework. The chapter describes the validation process, which includes both external and internal validation. The internal validation was based on academic validation which involved the publication of some aspects of the research findings in journals and conference proceedings. In these papers, a significant number of references have been cited to support the different arguments. Moreover, the concepts, methodology and findings of this research have been found to be reasonably supported by the extensive use of literatures in support of the study. With respect to external validation, respondents who participated in the empirical data gathering phase were invited to share their opinions on the findings and their views were reported within this chapter. The results from the analysis of the participants' responses indicate that the findings reported in the research are valid and can be generalised across the SME sector in Nigeria. Likewise, the majority of the respondents who shared their opinions with regard to the findings, to a large extent agreed with the findings. In the next chapter, the conclusions of this research based on the analyses and validation process will be presented. The research limitations and recommendations for further research will also be put forward.

CHAPTER 8 - CONCLUSIONS AND RECOMMENDATIONS

8.0 Introduction

This chapter is aimed at concluding the research and is divided into eight sections. It provides an extensive explanation of the entire research which led to the identification of strategies that can assist in enhancing the adoption and effective utilisation of ICT in Nigerian SMEs. The first section provides an overview of the research. Discussions based on the accomplishment of the research aim and research questions are in the third section. The fourth section provides the key contributions of the research in three main aspects: knowledge, method and practice. The policy implications arising from this research are discussed in the fifth section. The sixth section provides some of the research limitations as observed by the researcher and suggestions for further research are presented in the seventh section. Finally, a summary which concludes the chapter is presented in the eighth section.

8.1 An Overview of the Research

In today's economy, modern advances in ICT coupled with the need for improved business processes, increased efficiency and the need for additional access to information have continued to motivate companies, including SMEs, to adopt and use various ICT solutions. There is much research on technology adoption but most is focused on developed countries with few on developing countries especially in the sub-Saharan Africa region (SSA) region, for example in Nigeria.

In developing countries generally, the adoption and effective utilisation of ICT is often hampered by factors such as lack of resources, lack of technological infrastructure amongst others as identified in chapters two and three of this thesis. The adoption of ICT and its effective utilisation amongst SMEs, especially in SSA countries, has remained low as reported by the Parliamentary Office of Science and Technology (2006) in Chapter two. In Nigeria, there have been few attempts to capture precisely the actual situation of ICT adoption/utilisation in the SME sector based on empirical studies that can provide a good explanation of the existing situation. However, the findings of this research have provided a comprehensive report on the case of Nigeria with specific emphasis on a particular region (Lagos, a metropolitan city in Nigeria). Samples for the research were carefully drawn

rather than randomly selected. The research integrated elements of previous studies in IS, e-business and so on with empirical data, to address the research concern.

The overall purpose of this research has been to ascertain factors affecting the adoption and effective utilisation of ICT, including sophisticated ICT applications/systems in Nigerian SMEs. Furthermore, the research is aimed at identifying strategies which can assist in stimulating the adoption and effective utilisation of ICT by Nigerian SMEs. In this research, key motivators for SMEs' decisions to adopt ICT have been identified and also SMEs' use of ICT with respect to improving organisational performance has been discussed. It is intended that the recommendations put forward, based on empirical findings in this research, would help to provide a guide for Nigerian SMEs to increase their take-up of ICT. The following section provides an overview of the research findings and outcomes.

8.2 Overview of the Research Findings and Research outcomes

This research has played a role in investigating factors affecting the adoption of ICT amongst some SMEs in Nigeria and the extent to which various ICT applications/systems, especially the sophisticated ones such as ERP, DMS, CRM and so on are utilised. The key objective of the research was to identify strategies that could assist in resolving the challenges faced by Nigerian SMEs with respect to ICT adoption and utilisation. Reviewing literature in the area of information systems in general, and particularly in the area of ICT adoption, revealed the lack of a success strategy that could serve as a guide in promoting the adoption and effective utilisation of ICT in Nigerian SMEs.

In this research the emergent themes of facts from participants in respect of their organisation's adoption of ICT and usage were not framed by any specific theoretical perspective, since the purpose of the research was not to test hypotheses or to force the data into any fixed framework. The subsequent sections briefly present and discuss the significant findings of each phase, then examine whether the research aim was achieved. The study's academic contribution and implications for practice are also discussed. The last section addresses the limitations of the study and some possible future research directions.

8.3 Achievement of the Research Aim and Research Questions

The aim of this research which is to identify/recommend strategies that will assist in stimulating or increasing the adoption and effective utilisation of ICT in Nigerian SMEs has been achieved, having identified strategies which led to the development of a framework that can assist in resolving the problems facing Nigerian SMEs with respect to the adoption and effective utilisation of ICT solutions including sophisticated applications/systems. The research found that some factors that affect ICT adoption/utilisation amongst Nigerian SMEs are similar to those identified in existing literature whereas others are based specifically on the Nigerian context. Although, from the analyses of literature, an overall understanding on ICT adoption in SMEs was gained, the majority of existing research is based on western countries and their experiences. Fewer researchers have focused on the adoption of ICT/effective utilisation in SMEs in developing countries.

The first research question considered motivators for and inhibitors to ICT adoption in Nigerian SMEs. The question was answered as the research identified seven key factors that motivate Nigerian SMEs to adopt ICT. They included the need for information availability whereby companies are able to access information at all times, the need for effective communication within and outside the SMEs so as to increase collaboration with other companies, SMEs' desire to improve their individual company's efficiency or speed leading to improvement in the company's effectiveness, the desire of SMEs wanting to automate their company's records in order to increase accuracy and in some cases, it was due to the nature of their business for example, telecommunication companies. However, the research found that many of the SMEs were eager to have some sort of competitive advantage by identifying strategies that would allow them to compete. Also, some of the SMEs were willing to increase customers' satisfaction, hence they were motivated to adopt ICT in order to provide exclusive services online. Likewise, the level of technological advancement in recent years and the need for some SMEs to acquire a better profile by advertising their products and services online, motivated them to adopt ICT.

Furthermore in addressing the first question, the research confirmed some inhibitors that hinder the adoption of ICT amongst some Nigerian SMEs that were yet to adopt. Likewise, a good number of the SMEs that were classified as users of ICT indicated similar reasons to either their non-adoption of sophisticated ICT applications or their ineffective utilisation

of ICT in general. The lack of electricity in the country was found to be a prominent issue affecting many SMEs. This is a reason why some of them resort to private companies for support or improvise ways in which they can provide electricity to run their businesses. The research shows that the problem associated with the lack of electrical supply contributes to many SMEs' huge investments in power generating sets. Another key factor that emerged from this research is the poor service offered by internet service providers. Other factors which were identified included the lack of requisite skills such as employees' inexperience with the internet, inadequate computer literacy, the cost associated with the implementation of the systems, training cost for employees on how to use the new systems and also the cost of maintenance. Similarly, the lack of awareness amongst SME owners/managers on the usefulness of adopting and effectively utilising ICT in their daily business operations was regarded as another factor. Furthermore, the government's failure to implement suitable policies or regulations that can stimulate the uptake of ICT in Nigerian SMEs was identified as a factor. In addition, SMEs usually encounter challenges while trying to obtain loans from banks. There is also a challenge linked to multiple payments of taxes and levies caused mainly by the high level of corruption in the country. The fear of online fraud was also found to be an inhibitor, especially with respect to the adoption of sophisticated or professional ICT applications.

The second research question addressed the level of ICT utilisation in the various SMEs that participated in the study. The research found that the level of usage of sophisticated ICT applications/systems is generally low, despite the fact that 65% of the SMEs who participated in the research were classified as users or adopters of ICT. The majority of the ICT users/adopters mainly utilise the traditional computer-based technologies such as standard office applications and basic tools such as telephone, fax and Microsoft office software. The internet is an exception as many Nigerian SMEs have access to the internet, despite the fact that the service is characterised by very slow transmission speed as a result of the poor services offered by the different ISPs in the country. Hence, it is concluded that Nigerian SMEs are not effectively utilising the internet. Furthermore, only a limited number of the SMEs make use of sophisticated communication technologies which assist them to communicate and share information digitally. More technically advanced software such as finance, HRM, CRM, ERP and custom-based packages are not utilised in spite of the increase in the utilisation of ICT in the present era. This indicates that Nigerian SMEs

are yet to realise the value of conducting businesses with the aid of sophisticated ICT applications/systems.

The impact of ICT on the organisational performance of SMEs was addressed as the third question for this research. ICT has been identified as an essential tool that should be aligned with every company's organisational strategy. Although the research findings indicate that the benefits resulting from ICT investment vary significantly amongst the SMEs who participated in the study, to a large extent they all identified one or more benefits which their companies have experienced since the inception of the use of ICT. All the participants noted that their companies have derived some benefits as a result of their investments in ICTs ranging from hardware to software applications. Some of the benefits attributed to their use of ICT included increased competitive advantage, improved efficiency, improved communication, increased access to information, improved method of planning, increased awareness and more potential to increase profit and promote business confidence especially if a company owns a website.

The fourth research question attempted to determine in detail the extent to which Nigerian SMEs utilise sophisticated ICT applications, after determining the level of ICT utilisation in general amongst the SMEs as part of the second objective. The researcher further observed that even though a large number of SMEs mainly utilise traditional-based ICT applications, as opposed to advanced/sophisticated ICT, the majority of SMEs are still willing to adopt more sophisticated ICT solutions. Although six of the selected case studies had adopted different forms of sophisticated ICT, nonetheless there was a large disparity with respect to their level of acquisition as described in chapter six.

The fifth research question identified success strategies that can assist in overcoming the challenges presently experienced by Nigerian SMEs. Empirical data based on the results obtained during the data collection assisted in identifying strategies for success. Some recommendations were put forward which lead to the development of a framework that can facilitate a successful adoption and effective utilisation process, and can further help the deployment of more sophisticated ICT solutions. The framework depicts, empirically, recommendations that can enhance the increased use of ICT in Nigerian SMEs. The framework which was also validated, addressed organisational and technological issues at both national and agency level.

The researcher observed that many strategies identified that can bring about an increase in the area of technology use are the sole responsibility of the government and other stakeholders such as the internet service providers, as well as the owners/managers of SMEs. Responsibilities of the government, owners/managers and ISPs were clearly indicated to guarantee a successful process. This will assist policy makers in general to develop a successful ICT strategy. Overall, in addressing the research questions and objectives, the research findings concur with some findings in the literature review chapters. Also, the literature review, in conjunction with the empirical data, confirmed that the adoption and effective utilisation of ICT in Nigerian SMEs require significant changes in order to increase take-up of ICT. It is important to note that a range of issues such as managerial strategies, organisational structures amongst others can lead to the success or failure of ICT adoption as well as effective utilisation in SMEs. This research has stressed the need for every Nigerian SME to adopt ICT by revealing the importance of effectively utilising ICT, more especially sophisticated ICT applications/systems.

8.4 Research Contributions

This section of the chapter presents the contributions of this research.

8.4.1 Contributions to the General Body of Knowledge

This research has contributed to the existing body of literature and the field of information systems by identifying the inadequacies of previous studies regarding ICT adoption in developing countries, with particular emphasis on Nigeria. The research has empirically identified key factors affecting the adoption and effective utilisation of ICT including sophisticated ICT solutions amongst Nigerian SMEs in a particular geographical location.

No previous study had empirically considered how Nigerian SMEs utilise ICT or had identified the types of ICT applications/systems commonly used by Nigerian SMEs. There is lack of scholarly articles on the level of utilisation of ICT applications/systems amongst Nigerian SMEs. Therefore, this study adds to the existing body of literature and makes specific contributions to the field of IS by providing insights on the level of ICT utilisation or use amongst Nigerian SMEs as well as being able to identify the types of ICT applications/systems mostly used by the SMEs.

It was observed that no previous research had put forward success strategies or a guide for resolving the various issues facing Nigerian SMEs with respect to ICT adoption and effective utilisation. Hence, this research is considered as one of the pioneer studies in the area, as the study has put together success strategies in the form of a framework that can assist the Nigerian government, stakeholders such as ISPs, as well as owners/managers of SMEs, to resolve the problems facing these SMEs. In other words, creating a novel framework to aid the successful adoption and effective utilisation of ICT constitutes the central contribution of this research as the framework is developed based on empirical data and provides a comprehensive guide to assist many SMEs in Nigeria. Overall, the framework provides a dynamic view of the factors that can increase the adoption/effective utilisation of ICT in Nigeria as the recommendations/strategies for success will improve understanding of the process for successful ICT adoption.

This research has also made a novel contribution to the area of ICT adoption as it has identified the major stakeholders responsible for promoting the adoption and effective utilisation of ICT amongst Nigerian SMEs, which has not been identified in previous researches.

The framework that has been developed in this research can be applied by other researchers considering research in similar areas such as the adoption or use of new technologies as well as research involving SMEs. Besides, feedback from the validation chapter indicates that the framework would not only assist SMEs in Nigeria but can help developing countries as a whole since issues relating to SMEs are homogeneous. The framework will generally assist decision makers to set a strategic action plan for the further overall development of the SME sector.

The research has also identified key motivating factors for ICT adoption in Nigerian SMEs and common benefits of ICT with respect to the organisational performance of many SMEs who effectively utilise ICT solutions. Although some literatures have identified both the barriers to and the benefits of ICT adoption, only a few literatures have considered SMEs' effective use or utilisation of ICT. Adopting ICT is not just a solution to SMEs having the latest advancements, as their effective utilisation is paramount as well, especially in their utilisation of specialised/sophisticated/advanced/professional information and communication technology applications/systems/solutions. Besides, the

benefits identified in this research can provide further insights on the impacts of ICT. Thus, insightful findings from this research can complement previously accumulated knowledge on the benefits of ICT in organisations.

This research contributes to knowledge by validating the findings which comprise the key factors hampering SMEs' advancements in Nigeria as well as validation of the success strategies that have been put together in this research to assist in overcoming the challenges. Also the framework which is regarded as a novel taxonomy has been validated. The validation process confirmed some of the previous research findings in Chapter three and further identified new research findings that have not been explored before, with respect to ICT and Nigerian SMEs as indicated in Chapters five and six.

The research contributes to existing literature as it provides suggestions to bridge the digital divide, by emphasising the need for relatively advanced ICT infrastructures in Nigeria that can speed up the deployment of ICT both in urban and rural areas and the need for stakeholders such as the commercial banks amongst others, to help develop SMEs' capability in Nigeria.

Insights from this research show that factors which affect the adoption and effective use of ICT in every country are different, although some factors may be similar. Previous research, as indicated in chapter three, had identified, for example, the lack of finance as a key factor that affects ICT adoption in SMEs. However, in this research, although finance is important but the poor service provided by ISPs was more prevalent as an inhibitor for adoption. The research findings suggest that many SMEs would like to adopt sophisticated ICT if the internet service providers were reliable. This research provides a richer view of the factors that affect ICT adoption in Nigeria than found in the previous studies uncovered during the review of existing literatures.

8.4.2 Methodological Contributions

The research makes a methodological contribution by using different data collection methods referred to as triangulation, to assist in increasing the validity of the research findings. Many of the studies that have examined the adoption of ICT in developing countries in the past have focused on a single data collection method. However, this study has used various approaches in addressing issues relating to ICT adoption in Nigerian

SMEs, and further determined the extent to which Nigerian SMEs utilise ICT in conducting their businesses, especially sophisticated ICT applications. In addition, this research employs content and thematic analysis for analysing empirical data.

The methodological contributions of this research not only include the use of triangulation but also use of an exploratory case study research strategy. The use of this strategy was found to be very useful in providing a clear understanding of the process of ICT adoption and utilisation in the Nigerian SME sector. The strategy also enabled the researcher to recognise key issues surrounding the process. Furthermore, the research made use of triangulated data involving semi-structured interviews, observations and the review of documents such as company reports as primary sources of evidence whilst secondary sources of evidence comprised mainly journals, conference papers, text books and so on. Triangulation provides several advantages that help to overcome the problems associated with using a single data collection method.

This research again makes a substantial contribution from the research methodology, having established and validated measures relating to the different constructs of the research, including those in the framework.

Methodologically, the research employed a questionnaire survey, qualitative interviews, observations and review of documents as data collection tools. This means that the research employed both qualitative and quantitative approaches in order to provide in-depth information about the subject. The analysis of data collected involving content and thematic analysis was further used to develop a framework to stimulate the uptake of ICT and its effective utilisation in Nigerian SMEs.

Researchers (e.g. Palvia et al., 2003) have called for more methodological rigour in the field of IS research. Palvia et al. (2003) note that trends in the field of information systems have shown that the survey method is a dominant data collection method with case studies and qualitative research methods being least employed. Again, this research applied the qualitative research method for data collection, and the study is based on seven case studies. The research therefore adopted a multi-method approach to data collection based on interpretivist paradigm and makes a methodological contribution to the field of IS. To the researcher's knowledge, this is the first research that has employed a multi-method data

collection approach based on interpretivist paradigm for investigating factors affecting the adoption and effective utilisation of ICT amongst SMEs in a metropolitan city in Nigeria.

8.4.3 Practical Contributions

This research has contributed to policy and practice by providing a rich insight into SMEs' experiences with respect to ICT adoption and use. This is evident, based on the different views of the individual participants who participated in the study. The analyses of the participants' views opened up areas for further attention of the government and other stakeholders, as discussed in Chapters 5, 6 and 7. As a result of this study, SMEs can now benefit more from the government and other stakeholders that are involved in their affairs. Consequently, this can result in SMEs becoming more enlightened about certain government policies and the effects of such policies on their business.

This research has offered suggestions on how the Nigerian government and people at ministerial level can support ICT development in SMEs, which can help to expand the country's economy. Moreover, in view of the factors that have been identified as issues militating against the adoption and effective use of ICT by SMEs in Nigeria, and given the current effort of the Nigerian government to formulate a new ICT policy, adopting the proposed framework in this research will bring about laudable socio-economic developments that the Nigerian government is aiming to achieve.

The contributions of this research is timely, as the country's Minister of Communications Technology is now urging Nigerian SMEs to embrace ICT for development and has requested stakeholders to make contributions that can be incorporated into a new ICT policy. The promotion of ICT by the government will facilitate rapid growth and national development not only in SMEs, but in all facets of the economy.

8.5 Research Implications

Given the importance of ICT adoption and the low level of utilisation amongst Nigerian SMEs, there is great need for more understanding of key factors relating to the adoption and use of ICT, which this research has attempted to examine. Moreover, the findings of this research have a number of important implications that may assist owners/managers, ISP providers, the government and other policy makers to facilitate the adoption of ICT, as earlier stated. Other implications of this research are highlighted in the following sections.

8.5.1 Implications for Practice

In terms of implications for practice, the framework offers a guide for the adoption process which will be useful for those involved in ensuring the further development of SMEs, to inspire many SMEs to shift from utilising mainly traditional-based ICT applications/systems to utilising more sophisticated/advanced ICT applications. The recommendations and strategies for success have been validated and were considered to be very useful by respondents, hence the framework can be proposed to other SMEs in different regions within Nigeria as well as other developing countries, especially in Africa. The framework would assist SMEs that are classified as adopters or users of ICT to recognise the key adoption issues that can facilitate or restrict their further adoption and effective utilisation of more sophisticated ICT systems/applications, and how issues surrounding the entire process could be handled in practice.

8.5.2 Implications for Managers

Findings from this research have important implications for managers who are making efforts to adopt sophisticated ICT solutions such as e-commerce into their businesses. These are managers who are interested in expanding their base and generating more revenue. Indeed, this research sought to assist SMEs to become more successful in migrating from the use of only traditional-based ICT applications to more advanced or sophisticated ones. Empirical findings from this research have established the importance of the various roles played by owners/managers in stimulating the adoption/effective utilisation of ICT in SMEs. Without the commitment and support of owners/managers of SMEs, the rate of ICT adoption and effective utilisation will remain low. Top management support is imperative for enhancing the level of ICT deployment. Owners/managers should offer continuous support to initiatives that will increase the use of ICT.

8.5.3 Implications for Government and Policy Makers

Government bodies and other policy makers that have the task of supporting SMEs should ensure SMEs incorporate ICT applications/systems in their business processes as it will help to improve their competitiveness in the present digital economy. This would need the government to review its policies and introduce more initiatives that will promote ICT adoption within the SME sector.

Taking all the above into account, it can be argued that the contributions of this research are important to SMEs owners/managers, ISPs, the government and other vendors and policy makers. This research is considered relevant to this current era of rapid advancements and the results obtained will help to fill a gap in the academic literature. The framework which was developed in this research will help small businesses not just in SSA but in the other developing countries, to transform their SME sector by taking advantage of the opportunities offered by ICT. Implementing the framework will help SMEs in Nigeria, and SSA in general, to attract more businesses including foreign businesses as more companies will be willing to enter into business relationships.

8.6 Limitations of the Research

There can be no research without limitations. As is the case with other studies, this research has a number of limitations that need to be addressed, as discussed below.

One limitation of this research is the fact that the collection of empirical data depended mainly on the level of access that was granted to the researcher. Therefore, the participants could have hidden some vital information from the researcher, which could possibly have improved the research outcome, without the researcher's knowledge.

The study was limited to SMEs in the city of Lagos, the most cosmopolitan city in Nigeria. It is the researcher's belief that although the research was limited to Lagos, nevertheless, some of the research findings are likely to be similar to those in other parts of Nigeria. However, the present research findings cannot be generalised without additional research. Similarly, despite the fact that issues concerning SMEs in Nigeria are homogeneous, it is still difficult to generalise Nigeria's results to other developing countries of the world without conducting additional research.

A limitation of the research methodology is concerned with the use of the multiple case study approach. Although this research made use of multiple case studies which assisted in providing broad and unique insights on ICT adoption issues in SMEs, nonetheless the data obtained from the individual companies cannot be generalised.

The researcher notes that results of data gathered from the various participants were reported by only one person. Hence, another researcher may interpret the participants' views or the research results in a different way.

8.7 Recommendations for Further Research

The findings of this research and the research limitations have resulted in the identification of potential future research directions for investigation. The recommendations for further research as a result of this study are indicated below.

More research is needed to further validate the findings, in order to increase the generalisation of the results in different areas within Nigeria and over different regions in Africa. Re-testing the research findings and the recommendations in different regions within Nigeria especially, will help to determine whether the findings have the same impact or are less significant in other areas.

The framework should be validated in different contexts to extend the generalisability and contribution of the framework. Also, there could be further investigations that can extend the framework as new factors could emerge after some time.

Comparative studies can be conducted in other SSA countries, for example Ghana, to determine differences in the context of developing countries. For example, in the developed countries, researchers have compared ICT adoption strategies between countries such as the UK and the USA.

In spite of the fact that much research has been conducted in the area of ICT adoption, the area related to ICT use or utilisation is still relatively new. Thus, more research still needs to be conducted in other areas within Nigeria as well as other developing countries. Future research should expand the understanding of ICT adoption and effective utilisation beyond the scope of the current research.

From the review of the literature, it appears that no existing research had examined the level of utilisation of traditional-based or sophisticated ICT solutions in SMEs. It will be useful to conduct further research in this area.

8.8 Summary

It is expected that future research will extend knowledge of ICT adoption and effective utilisation by considering other regions beyond the area covered by this research. Insights from the investigation suggest that, as organisations adopt and utilise more sophisticated ICT applications, issues relating to electricity supply, amongst others, stand as major barriers to ICT adoption in Nigerian SMEs. However, due to the benefits associated with ICT, some SMEs are still motivated to utilise more sophisticated ICT applications/systems. The benefits range from enhanced competitive advantage to improved customer service, increased market reach and so on. This research found that SMEs' owners/managers attitudes towards ICT play a key role in promoting the effective utilisation of ICT amongst employees.

Research conducted by Harindranath et al. (2008b) on adoption issues concluded that "progress in the deployment of ICT typically depends on a single individual with vision who takes full responsibility for ICT initiatives, as well as continuing with their regular activities". It is expected that the findings obtained in this study would be beneficial in providing some necessary guidance for SMEs wishing to adopt and effectively use ICT in other developing countries. This research has fulfilled its goals and expectations and has answered all research questions set out at the beginning of the study. The research has provided significant contributions towards explaining the factors influencing/affecting the adoption and effective utilisation of ICT in Nigerian SMEs. Although many researchers have tried to investigate the factors that affect ICT adoption in SMEs, no approach had yet been put forward which could serve as a guide in resolving the problems facing Nigerian SMEs.

This chapter has presented the contributions of this research to the body of knowledge which include the developed framework, the research methods adopted for the study and how they were applied, key limitations of the present research as well as recommendations for future research. The research also adds to the body of knowledge by empirically providing evidence that can increase the knowledge of ICT adoption and usage in small businesses thereby expanding the research area, in the field of IS. The research findings are beneficial to academics, practitioners, and policy makers.

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APPENDICES

Appendix A - Cover Letter for Surveys

Dean: Professor R Moreton BA(Hons) MTech FBCS CITP ILTM
University of Wolverhampton
Technology Centre
MI Building
Wulfruna Street
Wolverhampton
WV1 1LY
United Kingdom
Telephone Codes
UK: 01902 Abroad: +44 1902
Switchboard 321000
Fax 321478

28 September 2009.

Dear Sir/Madam,

I am a PhD student at the University of Wolverhampton, United Kingdom under the supervision of Dr. Ann Latham and Prof. Rob Moreton. I am currently undertaking a research that considers factors affecting the adoption and effective utilisation of Information and Communications Technology (ICT) within Small and Medium Sized Enterprises (SMEs) in Nigeria.

As Owners/Managers of SMEs, it is important to know your views regarding the impact of ICT in your organisation. Results from this research will yield valuable information to individual organisations like yours and also to researchers. I am writing to request for your co-operation as I would be grateful if you could complete the short questionnaire and return it to me in the enclosed envelope by……

I assure you that the data and information provided will remain strictly confidential and will be used only for the purpose of this research.

Thank you for your assistance.

Yours faithfully,

Idisemi Apulu
(Research Student)

Appendix B - Questionnaire for Selecting SMEs

Company Name:

Address:

Telephone Number:

Name of Participant:

Position:

Questions

1. **How many employees does your company have?**

Please specify …….

2. **What is the average level of education amongst your employees?**

Primary school ☐
Secondary school ☐
Technical college ☐
First degree/Bachelors degree ☐
Masters degree ☐
Doctoral degree ☐

3. **What is the type of your firm?**

Engineering ☐
Grocery/Food processing ☐
Financial services ☐
Chemicals/Electrical/Electronic products ☐
Construction ☐
Pharmaceuticals ☐
Communication ☐
Textile and clothing ☐
Manufacturing ☐
Other (please specify)……

4. **Do you use ICT in your business?**

Yes ☐ If yes, go to question 5. No ☐ If no, go to question 10.

5. **How many computers do you have in your company?**

Please specify……

6. **What ICT technologies are in place in your company?**

Please specify both basic and sophisticated ICT applications

……

……

……

……

……

7. **Does your business rely on technology?**

Yes ☐ No ☐

8. **Who makes technology related decisions in your company?**

Please specify……

……..

9. **Are your employees computer literate?**

Yes ☐ No ☐

If yes, please specify: the Majority ☐
Minority ☐
A few ☐

10. **Please give reasons why you do not use ICT in your business.**

…….....

……

……

……

.....

……

……

……

……

……

THANK YOU FOR YOUR TIME!

Appendix C – Cover Letter for Interviews/Consent Form

Dean: Professor R Moreton BA(Hons) MTech FBCS CITP ILTM
University of Wolverhampton
Technology Centre
MI Building
Wulfruna Street
Wolverhampton
WV1 1LY
United Kingdom

Telephone Codes
UK: 01902 Abroad: +44 1902
Switchboard 321000
Fax 321478

5th October 2009.

Dear Sir/Madam,

I am a PhD student at the University of Wolverhampton, United Kingdom. I am currently conducting research on Information and Communication Technology (ICT) adoption and, its effective utilisation amongst Small and Medium Sized Enterprises (SMEs) in Nigerian. The purpose of the research is to better understand key factors affecting the adoption of ICT in Nigerian SMEs and further identify strategies that could help to stimulate the adoption and effective utilisation of ICT by Nigerian SMEs.

I would be very grateful if you could participate in an interview regarding this research. Please indicate your willingness to participate in this exercise by signing and returning the declaration below. Thank you.

Yours faithfully,

Idisemi Apulu

(PhD student)

Declaration:

I wish to be interviewed. I understand that any information I provide will remain strictly confidential and only for the purpose of this research.

Signature……...

Organisation……..

Preferred date of interview…….

Preferred time of interview…….

Return to……..

By……

Appendix D - Interview Questions for SMEs

Company Name:

Address:

Telephone Number:

Name of participant:

Position:

Questions for Owners/Managers

Section 1: Background Questions

This section comprises of general question about the company. You need not answer some questions (e.g. Q 10) if you do not wish to.

1. What is the history of this company?
2. Please describe the current organisational structure of your company.
3. What products do you offer to your customers?
4. What are your company's goals and objectives?
5. How many employees do you have in your company?
6. Are they all full time workers?
7. Please describe your target market.
8. Has your target market changed over the years?
9. How would you describe your business environment?
10. What is your annual turnover?
11. Who are your competitors?
12. What does the term organisational culture mean to you?
13. Is the culture consistent with the current objectives and policies of the company?
14. Do employees abide by the policies?

Section 2: Questions on Decision making/Implementation of ICT

1. Who initiated the idea to adopt ICT in your company?
2. Who were involved in the decision making process?
3. What was the type(s) of ICT solution considered for adoption?
4. What were the major reasons/drivers/motivators for ICT adoption in your organisation?
5. What were the inhibitors to the adoption process?

Section 3: Questions on ICT Evaluation after adoption

1. What are the impacts of ICT on your company's organisational performance?
2. Are there any factor(s) affecting the effective utilisation of your company's ICTs?
3. Can you comment on the overall ICT strategy in your company?
4. Would you consider adopting more sophisticated/advanced ICTs in the future?
5. What do you consider to be a key success in your business?
6. Is there anything else you want to share with me generally or personally regarding your experience during the course of your work with these technologies?
7. Is there any documentation that you think would be relevant for me to have a look at?

Questions for IT Mangers/IT Officers/Administrative Staff

1. What are your duties in the company?
2. Is your postition related to ICT implementation?
3. Does your company have an IT department?
4. Please describe the various ICT applications/infrastructures that are in your company.
6. How do you acquire ICT facilities in your company?
7. Please describe the experience(s) you have gained from adopting ICT.
8. Does ICT have an effect on your company's organisational performance?
9. What are the benefits associated with the use of ICT in your company?
10. Are there any factor(s) affecting the effective utilisation of your company's ICTs?
11. What are the drawbacks associated with the use of ICT in your company?
12. From your point of view, what factors contribute to the success of adopting ICT?

Appendix E – Cover Letter for the Validation

School of Technology
University of Wolverhampton
Wulfruna Street
Wolverhampton
WV1 1LY
United Kindom

T. +44(0)1902 321000
F. +44(0)1902 321478/322743
W. www.wlv.ac.uk/stech

13th September 2011

Dear Sir/Madam,

A FRAMEWORK FOR VALIDATION ON STRATEGIES FOR STIMULATING INFORMATION AND COMMUNICATION TECHNOLOGY ADOPTION AND ITS EFFECTIVE UTILISATION AMONGST SMALL AND MEDIUM SIZED ENTERPRISES IN NIGERIA

Thank you for participating in the data gathering for my PhD research. I have now identified strategies that can stimulate the successful adoption of ICT, its effective utilisation and also, aid the adoption/utilisation of more sophisticated ICT applications in Nigerian SMEs. The research has identified eight key factors that affect the adoption and effective utilisation of ICT in Nigerian SMEs and further recommends strategies on how to resolve the problems militating against them. The research finally identified three entities (the government, internet service providers and owners/managers) that are responsible for ensuring that SMEs in Nigeria utilise modern technological advances.

It is thought that the attached framework would be a useful resource to the government, owners/managers and other stakeholders, particularly for enhancing ICT adoption within Nigerian SMEs since they play a vital role in the Nigerian economy. In view of this, I would be very grateful if you could please respond to the feedback form attached, to help establish the relevance of the research findings and recommendations. As before, confidentiality and anonymity are guaranteed as all the information gathered will conform to the University's Ethical procedure. Please return the completed feedback sheet by email or by post. Alternatively, if you wish to give the feedback over the telephone please send me an email. Contact details are provided below.

I would like to thank you in advance for your valued and kind consideration.

If you would like to receive further information about the research, please feel free to contact me.

Yours faithfully,

Idisemi Apulu
Doctoral Research Student
School of Technology (STech)
University of Wolverhampton
Wulfruna Street, Wolverhampton
WV1 1LY
Tel: +44(0)1902321271
Mobile: +44(0)7765785662
E-mail: i.apulu@wlv.ac.uk

Appendix F - Questionnaire for Validation of the Research Findings

RESEARCH FEEDBACK FORM

Please provide responses on how valid the research findings are with regards to your experience.

1. The lack of steady electricity has remained a major challenge to the adoption and effective utilisation of ICT applications in Nigerian SMEs. To what extent do you agree with this finding? Please tick [✓] one option.

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

2. The lack of adequate financial resources and the cost of training employees place significant constraints on SMEs adoption and effective utilisation of ICT in Nigeria. To what extent do you generally agree with this? Please tick [✓] one option.

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

3. Government supportive measures such as policies for Nigerian SMEs are inadequate and prevent many SMEs from adopting or effectively utilising ICT. To what extent do you agree with this finding? Please tick [✓] one option.

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

4. The irregular services provided by Internet Service Providers in Nigeria are characterised by very low bandwidths, high subscription costs, together with frequent disconnection of the networks and has been found to be one of the most prevalent issues preventing Nigerian SMEs from effectively deploying ICT. To what extent do you agree with this finding? Please tick [✓] one option.

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

5. Nigerian SMEs are characterised by multiple taxes and levies due to the high level of corruption in the country. To what extent do you agree with this finding? Please tick [✓] one option.

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

6. The economic potentials of ICT are yet to be fully harnessed by Nigerian SMEs owing to lack of resources due to lack of support from banks. To what extent do you agree with this finding? Please tick [✓] one option.

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

7. The lack of infrastructural facilities in general, is a major challenge to SMEs in Nigeria. To what extent do you agree with this finding? Please tick [✓] one option.

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

8. Skills deficiencies and lack of knowledge amongst employees prevent the adoption of particularly sophisticated ICT solutions in a number of Nigerian SMEs. To what extent do you agree with this finding? Please tick [✓] one option.

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

9. The lack of awareness amongst owners/managers affects the adoption of ICT in Nigerian SMEs. To what extent do you agree with this finding? Please tick [✓] one option.

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

SUGGESTED RECOMMENDATIONS

Based on the research findings the following recommendations have been given. Please provide responses on the relevance of the recommendations with regards to your experience.

1. The liberalisation of Nigeria's power sector would act as a roadmap to resolving the continuing problem facing the country's power sector. To what extent do you agree with this recommendation? Please tick [✓] one option.

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

2. Appropriate legal regulatory framework would encourage private sector participation and also assist to reform Nigeria's power sector. To what extent do you agree with this recommendation? Please tick [✓] one option.

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

3. Internet Service Providers should extend their services nationwide in order to increase ICT deployment. To what extent do you agree with this recommendation? Please tick [✓] one option.

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

4. The Nigerian government should put in place new telecommunication infrastructures that would increase interconnectivity. To what extent do you agree with this recommendation? Please tick [✓] one option.

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

5. The Nigerian government should provide workable funding schemes and long term policies for Nigerian SMEs. To what extent do you agree with this recommendation? Please tick [✓] one option.

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

6. The Nigerian government should improve the business conditions of Nigerian SMEs by liaising with banks and by boosting their overall capability. To what extent do you agree with these recommendations? Please tick [✓] one option.

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

7. The government should introduce a regulatory policy that would reduce interest rates by micro finance banks in order to support SMEs. To what extent do you agree with this recommendation? Please tick [✓] one option.

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

8. It is suggested that the Nigerian government resolves the problem facing Nigerian SMEs with regards to multiple taxes and levies. To what extent do you agree with this recommendation? Please tick [✓] one option.

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

9. The government should conduct enlightenment programmes that would increase awareness on the consequences of corrupt practices. To what extent do you agree with this recommendation? Please tick [✓] one option.

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

10. The government should conduct training programmes to educate SME owners/managers on the importance of ICT and owners/mangers ought to conduct such training programmes for their employees. To what extent do you agree with this recommendation? Please tick [✓] one option.

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

11. The Nigerian government needs to ensure ICT related skills and technology form a part of the country's educational curriculum in every institution. To what extent do you agree with this recommendation? Please tick [✓] one option.

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

12. Would you say that the framework is capable of assisting the government in guiding Nigerian SMEs to adopt and effectively utilise ICT?

( ) Not sure of its capability ( ) No, not capable ( ) Neutral ( ) Yes, capable ( ) Yes, highly capable

13. Would you say that the framework is capable of assisting owners/managers of SMEs to adopt and effectively utilise ICT?

( ) Not sure of its capability ( ) No, not capable ( ) Neutral ( ) Yes, capable ( ) Yes, highly capable

14. Would you say that the framework is capable of assisting other stakeholders such as Internet Service Providers in improving their services?

( ) Not sure of its capability ( ) No, not capable ( ) Neutral ( ) Yes, capable ( ) Yes, highly capable

Please provide any additional comments here (Please add extra pages if required).

THANK YOU VERY MUCH FOR YOUR TIME!!!

NOW PLEASE SEND THE FEEDBACK FORM TO: i.apulu@wlv.ac.uk

Appendix G – Analysis of Validation Results using SPSS

Validation of Research Findings –Results from Case Studies

```
FREQUENCIES VARIABLES=Electricity Finance_Training_Cost Government_Policies Internet_Service Tax_Levies Banks_Support
Infrastructural_Inadequacies Skills_Knowledge Owner_Managers_Awareness
  /ORDER=ANALYSIS
```

	Electricity	Finance_Training_Cost	Government_Policies	Internet_Service	Tax_Levies	Banks_Support	Infrastructural_Inadequacies	Skills_Knowledge	Owner_Managers_Awareness
N Valid	18	18	18	18	18	18	18	18	18
Missing	0	0	0	0	0	0	0	0	0

Frequency Tables

Electricity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	2	11.1	11.1	11.1
	3	1	5.6	5.6	16.7
	4	3	16.7	16.7	33.3
	5	12	66.7	66.7	100.0
	Total	18	100.0	100.0	

Finance_Training_Cost

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1	5.6	5.6	5.6
	3	2	11.1	11.1	16.7
	4	7	38.9	38.9	55.6
	5	8	44.4	44.4	100.0
	Total	18	100.0	100.0	

Government_Policies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1	5.6	5.6	5.6
	2	3	16.7	16.7	22.2
	3	2	11.1	11.1	33.3
	4	8	44.4	44.4	77.8
	5	4	22.2	22.2	100.0
	Total	18	100.0	100.0	

Tax_Levies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	4	22.2	22.2	22.2
	3	4	22.2	22.2	44.4
	4	6	33.3	33.3	77.8
	5	4	22.2	22.2	100.0
	Total	18	100.0	100.0	

Internet_Service

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1	5.6	5.6	5.6
	3	1	5.6	5.6	11.1
	4	10	55.6	55.6	66.7
	5	6	33.3	33.3	100.0
	Total	18	100.0	100.0	

Banks_Support

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1	5.6	5.6	5.6
	3	2	11.1	11.1	16.7
	4	7	38.9	38.9	55.6
	5	8	44.4	44.4	100.0
	Total	18	100.0	100.0	

Owner_Managers_Awareness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1	5.6	5.6	5.6
	3	3	16.7	16.7	22.2
	4	13	72.2	72.2	94.4
	5	1	5.6	5.6	100.0
	Total	18	100.0	100.0	

Skills_Knowledge

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	3	16.7	16.7	16.7
	3	1	5.6	5.6	22.2
	4	11	61.1	61.1	83.3
	5	3	16.7	16.7	100.0
	Total	18	100.0	100.0	

Validation of Recommendations/Framework – Results from case studies

```
FREQUENCIES VARIABLES=Libralisation Regulatory_Framework Nationwide_Internet_Service Telecommunications_Infrastructures Funding_Schem
   es Liaise_with_Banks Reduce_Interest_rates Taxation Tackle_Corruption
  /ORDER=ANALYSIS.
```

Frequencies

Statistics

		Libralisation	Regulatory_ Framework	Nationwide_Internet _Service	Telecommunications _Infrastructures	Funding_ Schemes	Liaise_with_Banks	Reduce_Interest_ rates	Taxation	Tackle_Corruption
N	Valid	18	18	18	18	18	18	18	18	18
	Missing	0	0	0	0	0	0	0	0	0

Frequency Tables

Libralisation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1	5.6	5.6	5.6
	3	1	5.6	5.6	11.1
	4	5	27.8	27.8	38.9
	5	11	61.1	61.1	100.0
	Total	18	100.0	100.0	

Nationwide_Internet_Service

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	3	16.7	16.7	16.7
	3	1	5.6	5.6	22.2
	4	9	50.0	50.0	72.2
	5	5	27.8	27.8	100.0
	Total	18	100.0	100.0	

Regulatory_Framework

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	2	11.1	11.1	11.1
	3	2	11.1	11.1	22.2
	4	6	33.3	33.3	55.6
	5	8	44.4	44.4	100.0
	Total	18	100.0	100.0	

Nationwide_Internet_Service

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	3	16.7	16.7	16.7
	3	1	5.6	5.6	22.2
	4	9	50.0	50.0	72.2
	5	5	27.8	27.8	100.0
	Total	18	100.0	100.0	

Funding_Schemes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	3	16.7	16.7	16.7
	3	4	22.2	22.2	38.9
	4	6	33.3	33.3	72.2
	5	5	27.8	27.8	100.0
	Total	18	100.0	100.0	

Telecommunications_Infrastructures

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	3	16.7	16.7	16.7
	3	1	5.6	5.6	22.2
	4	6	33.3	33.3	55.6
	5	8	44.4	44.4	100.0
	Total	18	100.0	100.0	

Liaise_with_Banks

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	4	13	72.2	72.2	72.2
	5	5	27.8	27.8	100.0
	Total	18	100.0	100.0	

Reduce_Interest_rates

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1	5.6	5.6	5.6
	3	1	5.6	5.6	11.1
	4	8	44.4	44.4	55.6
	5	8	44.4	44.4	100.0
	Total	18	100.0	100.0	

Taxation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1	5.6	5.6	5.6
	2	2	11.1	11.1	16.7
	3	5	27.8	27.8	44.4
	4	5	27.8	27.8	72.2
	5	5	27.8	27.8	100.0
	Total	18	100.0	100.0	

Validation of Research Findings – Results from other ICT users and non-users

```
FREQUENCIES VARIABLES=Electricity Finance_Training_Cost Government_Policies Internet_Service Tax_Levies Banks_Support
    Other_Infrastructural_Inadequacies ICT_Skills_Knowledge Owners_Managers_Awareness/ORDER=ANALYSIS.
```

Statistics

		Electricity	Finance_Training_Cost	Government_Policies	Internet_Service	Tax_Levies	Banks_Support	Other_Infrastructural_Inadequacies	ICT_Skills_Knowledge	Owners_Managers_Awareness
N	Valid	45	45	45	45	45	45	45	45	45
	Missing	0	0	0	0	0	0	0	0	0

Frequencies

Electricity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	1	2.2	2.2	2.2
	4	23	51.1	51.1	53.3
	5	21	46.7	46.7	100.0
	Total	45	100.0	100.0	

Finance_Training_Cost

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	4	23	51.1	51.1	51.1
	5	22	48.9	48.9	100.0
	Total	45	100.0	100.0	

Government_Policies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1	2.2	2.2	2.2
	3	3	6.7	6.7	8.9
	4	20	44.4	44.4	53.3
	5	21	46.7	46.7	100.0
	Total	45	100.0	100.0	

Tax_Levies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	7	15.6	15.6	15.6
	3	8	17.8	17.8	33.3
	4	20	44.4	44.4	77.8
	5	10	22.2	22.2	100.0
	Total	45	100.0	100.0	

Internet_Service

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	4	17	37.8	37.8	37.8
	5	28	62.2	62.2	100.0
	Total	45	100.0	100.0	

Banks_Support

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	2	4.4	4.4	4.4
	3	5	11.1	11.1	15.6
	4	16	35.6	35.6	51.1
	5	22	48.9	48.9	100.0
	Total	45	100.0	100.0	

Other_Infrastructural_Inadequacies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	5	11.1	11.1	11.1
	4	13	28.9	28.9	40.0
	5	27	60.0	60.0	100.0
	Total	45	100.0	100.0	

Owners_Managers_Awareness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	1	2.2	2.2	2.2
	4	11	24.4	24.4	26.7
	5	33	73.3	73.3	100.0
	Total	45	100.0	100.0	

ICT_Skills_Knowledge

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	1	2.2	2.2	2.2
	4	11	24.4	24.4	26.7
	5	33	73.3	73.3	100.0
	Total	45	100.0	100.0	

Validation of Research Recommendations/Framework – Results from other ICT users and non-users

```
FREQUENCIES VARIABLES=Libralisation Regulatory_Framework Nationwide_Internet_Service Telecommunication_Infrastructure Funding_Scheme
   s Liaise_with_Banks Reduce_Interest_rates Taxation Tackle_Corruption Training ICT_Skills_Schools Framework_Government
    Framework_Owners_Managers Framework_Stakeholders  /ORDER=ANALYSIS.
```

Frequencies

```
[DataSet1] E:\CORRECTED CHAPTERS 2\SPSS VALIDATION REPORT\validation users and non-users-recommendation report.sav
```

Statistics

		Libralisation	Regulatory_Framework	Nationwide_Internet_Service	Telecommunication_Infrastructure	Funding_Schemes	Liaise_with_Banks	Reduce_Interest_rates	Taxation	Tackle_Corruption	Training	ICT_Skills_Schools	Framework_Government	Framework_Owners_Managers	Framework_Stakeholders
N	Valid	45	45	45	45	45	45	45	45	45	45	45	45	45	45
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Libralisation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	3	6.7	6.7	6.7
	3	10	22.2	22.2	28.9
	4	22	48.9	48.9	77.8
	5	10	22.2	22.2	100.0
	Total	45	100.0	100.0	

Regulatory_Framework

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	6	13.3	13.3	13.3
	4	16	35.6	35.6	48.9
	5	23	51.1	51.1	100.0
	Total	45	100.0	100.0	

Nationwide_Internet_Service

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	2	4.4	4.4	4.4
	3	10	22.2	22.2	26.7
	4	16	35.6	35.6	62.2
	5	17	37.8	37.8	100.0
	Total	45	100.0	100.0	

Nationwide_Internet_Service

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	2	4.4	4.4	4.4
	3	10	22.2	22.2	26.7
	4	16	35.6	35.6	62.2
	5	17	37.8	37.8	100.0
	Total	45	100.0	100.0	

Telecommunication_Infrastructure

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	3	6.7	6.7	6.7
	3	3	6.7	6.7	13.3
	4	21	46.7	46.7	60.0
	5	18	40.0	40.0	100.0
	Total	45	100.0	100.0	

Funding_Schemes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	2	4.4	4.4	4.4
	4	11	24.4	24.4	28.9
	5	32	71.1	71.1	100.0
	Total	45	100.0	100.0	

Liaise_with_Banks

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1	2.2	2.2	2.2
	3	6	13.3	13.3	15.6
	4	17	37.8	37.8	53.3
	5	21	46.7	46.7	100.0
	Total	45	100.0	100.0	

Reduce_Interest_rates

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1	2.2	2.2	2.2
	3	8	17.8	17.8	20.0
	4	12	26.7	26.7	46.7
	5	24	53.3	53.3	100.0
	Total	45	100.0	100.0	

Taxation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	2	4.4	4.4	4.4
	3	8	17.8	17.8	22.2
	4	19	42.2	42.2	64.4
	5	16	35.6	35.6	100.0
	Total	45	100.0	100.0	

Tackle_Corruption

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	1	2.2	2.2	2.2
	4	9	20.0	20.0	22.2
	5	35	77.8	77.8	100.0
	Total	45	100.0	100.0	

Training

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	1	2.2	2.2	2.2
	4	13	28.9	28.9	31.1
	5	31	68.9	68.9	100.0
	Total	45	100.0	100.0	

Framework_Owners_Managers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	4	8.9	8.9	8.9
	3	3	6.7	6.7	15.6
	4	22	48.9	48.9	64.4
	5	16	35.6	35.6	100.0
	Total	45	100.0	100.0	

ICT_Skills_Schools

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	2	4.4	4.4	4.4
	4	14	31.1	31.1	35.6
	5	29	64.4	64.4	100.0
	Total	45	100.0	100.0	

Framework_Government

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	3	6.7	6.7	6.7
	3	5	11.1	11.1	17.8
	4	27	60.0	60.0	77.8
	5	10	22.2	22.2	100.0
	Total	45	100.0	100.0	

Framework_Stakeholders

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	5	11.1	11.1	11.1
	2	1	2.2	2.2	13.3
	3	12	26.7	26.7	40.0
	4	18	40.0	40.0	80.0
	5	9	20.0	20.0	100.0
	Total	45	100.0	100.0	

Appendix H – Notes on Research Methodology

Note: Please refer to Chapter 4 in the main text.

H-1 Styles of Research

H-1.1 Constructive Research

Constructive research is concerned with developing frameworks, refining concepts or pursuing technical developments (Cornford and Smithson, 1996). According to Cornford and Smithson (1996), constructive research is concerned with models and framework that do not describe any existing reality but rather help to create a new one which does not necessarily have any physical realisation, for example, IS development methodologies. Caplinskas and Vasilecas (2004) state that the constructive research is a research procedure for producing innovative constructions, intended to solve problems faced in the real world and by that means to make a contribution to the theory of the discipline in which it is applied. Caplinskas and Vasilecas (2004) further note that "the constructive research can also be viewed as a form of conducting case research parallel to ethnographic, grounded theory, theory illustration, theory testing and action research." Constructive research is regarded as one of the most important methods in the IS research field (Caplinskas and Vasilecas, 2004).

H-1.2 Theoretical Research

Theoretical research is concerned with developing and refining a body of abstract understanding of phenomena and issues (Cornford and Smithson, 1996). It may be undertaken through a purely mental set of procedures, which will need to be fed with stimuli from outside sources (Cornford and Smithson, 1996). Theoretical research methods discuss induction and deduction, grounded theory, modelling, mathematical research, case study, phenomenography, comparative analysis, conceptual analysis, contextual analysis, longitudinal research, ethnographic and other qualitative approaches. Similarly, Caplinskas and Vasilecas (2004) agree that theoretical research concentrates on the methods related to the field of IS research which include conceptual modelling, ethnographic research, grounded theory, interpretative research and other qualitative research techniques.

H-1.3 Empirical Research

Empirical research is work that concerns itself more centrally with observing events in the world and then seeking to make sense of what is observed (Cornford and Smithson, 1996). According to Caplinskas and Vasilecas (2004), empirical research relies on an experience or observation alone, often without due regard for system and theory. Empirical research is data based and produces conclusions which are capable of being verified by observation or experiment. Caplinskas and Vasilecas (2004) state that experimental research in the field of IS is mostly used to evaluate the available tools and techniques.

H-1.4 Nomothetic Research

Nomothetic research is concerned with exploring empirical data in order to test hypotheses of a general character about a studied phenomenon (Cornford and Smithson, 1996). This style of research is concerned with a search for (and evidence to support) general laws or theories that cover a whole class or cases. Such research emphasises systematic protocols and hypothesis testing within the scientific tradition (Cornford and Smithson, 1996). Nomothetic methods are most appropriate for the deductive approach as this involves a highly structured research methodology which can be replicated and controlled, focusing on generating quantitative data with a view of explaining causal relationships (Crowther and Lancaster, 2008). Examples of nomothetic research methodologies include research which is based on controlled laboratory experimentation and is better suited to research in the natural sciences (Saunders et al., 2009).

H-1.5 Idiographic Research

Idiographic research is concerned with exploring a particular case or events and providing the richest picture of what transpires. The aim is to understand a phenomenon in its own particular context (Cornford and Smithson, 1996). According to Walsham (1995), idiographic research emphasises the analysis of subjective accounts based on participation or close association with everyday events. Idiographic research methods are less structured and are focused more on the explanation and understanding of phenomena with much more emphasis on qualitative data. As such, ideographic methods are better suited to the inductive research approach and in some ways are better suited to research in social sciences (Saunders et al., 2009). Walsham (1995) states that there is a strong tradition of case studies that could be regarded as examples of idiographic research.

H-1.6 Critical Research

Critical research is concerned with identifying power relations, conflicts and contradictions and empowering people to eliminate them as sources of alienation and domination (Oates, 2006). Critical research in the field of IS is usually described as an alternative research approach next to positivist and interpretivist research (Trauth, 2001). Critical research is also regarded as a paradigm or a world view that consists of beliefs about the physical and social reality (ontology, social relations and human rationality), knowledge (epistemology and methodology), and the relationship between theory and practice (Stahl, 2008). Furthermore, Stahl (2008) states that critical research can be based on realist/positivist ontology as well as on constructionist/interpretivist ontology.

H-2 Philosophical paradigms and Implications

	Positivism	**Interpretivism/ Social constructionism**
The observer	Must be independent	Is part of what is being observed
Human Interest	Should be irrelevant	Are the main drivers of the science
Explanations	Must demonstrate causality	Aim to increase general understanding of the situation
Research progress through	Hypotheses and deduction	Gathering rich data from which ideas are induced
Concepts	Need to be operationalized so that they can be measured	Should incorporate stake holder perspectives
Units of analysis	Should be reduced to the simplest terms	May include the complexity of 'whole' situation
Generalisation through	Statistical probability	Theoretical abstraction
Sampling requires	Large numbers selected randomly	Small numbers of cases chosen for specific reasons

Adapted from: Easterby-Smith et al. (2002)

H-3 Research Approaches

The key differences between the deductive and inductive approaches are described in the following table:

Deductive Approach	Inductive Approach
1. Scientific principles.	1. Gaining an understanding of the meanings humans attach to events.
2. Moving from theory to data.	2. A close understanding of the research context.
3. The need to explain causal relationships between variables.	3. A collection of qualitative data.
4. The application of controls to ensure validity of data.	4. A more flexible structure to permit changes of research emphasis as the research progresses.
5. The operationalisation of concepts to ensure clarity of definition.	5. A realisation that the researcher is part of the research process.
6. A highly structured approached.	6. Less concern with the need to generalise.
7. Researcher independence of what is being researched.	
8. The necessity to select samples of sufficient size in order to generalise conclusions.	

Differences between inductive and deductive approach (Adapted from Saunders et al., 2009).

H-4 Research Strategies

The following are some other types of research strategies which are used for conducting research:

H-4.1 Experiments

An experiment is a strategy that investigates cause and effect relationships, seeking to prove or disprove a causal link between a factor and an observed outcome. It is often associated with research in physical sciences (for example physics, chemistry and metallurgy) and is at the heart of the scientific method and positivism (Oates, 2006). Laboratory experiment is a research activity that is undertaken within controlled conditions. Within an experimental research design,

the researcher manipulates some variables and observes the results. Thus, there are independent variables that the researcher can control and dependent variables that can be measured. An experiment needs to be carefully constructed so as to expose some issue of interest and to generate appropriate data for subsequent analysis. Most of these data are usually quantitative in nature and relate to a limited number of phenomena (Cornford and Smithson, 1996). A research strategy based on experiments is typically characterised by a process of observation or measurement of a factor, manipulation of circumstances and re-observation or re-measurement of the factor to identify any changes (Oates, 2006).

H-4.2 Action Research

Action research, also known as collaborative research, is a strategy where the researcher forsakes their traditional role as observer of events and takes part with the subjects in the problem situation (Cornford and Smithson, 1996). For example, a researcher may work with the development team on a systems project, carrying out analysis, design, programming and testing. The research output is usually based on two parallel processes. First, the researcher uses their theoretical knowledge to shape the activity in which they participate. Second, through their reflection on the experience they can relate events to prior theoretical knowledge (Cornford and Smithson, 1996). Action research is often secure when a researcher has a specific skill or insight to offer and can secure the collaboration of people within the research site to put those ideas into action (Cornford and Smithson, 1996).

H-4.3 Ethnography

The purpose of ethnography is to understand the behaviours and attitudes of a cultural group. A native perspective is usually obtained by entering the group's environment to interview people and observe objects, events and symbols that define the culture and give it meaning (Collingridge and Gantt, 2008). Most well-constructed ethnographic studies generally are based on the following format of data collection and analysis which includes: collecting data through natural observation; creating a textual representation of the data; reading through the text and forming initial codes; analysing the codes to identify themes and patterns; interpreting the identified themes and patterns and creating a narrative account that describes the people, places, important objects and social events that define the culture and give it meaning (Collingridge and Gantt, 2008).

H-4.4 Grounded Theory

Grounded theory is a research method or strategy that seeks to develop theory that is grounded in data and systematically gathered (Myers, 1997). The purpose of grounded theory is to build or expand on theories about human phenomena. Grounded theory is a qualitative research design in which the inquirer generates a general explanation (a theory) of a process, action, or interaction shaped by the views of a large number of participants (Strauss and Corbin, 1998; Creswell, 2007). Creswell (2007) state that the theory has gained popularity in sociology, nursing, education, psychology and other social science fields.

H-5 Research Methods

	Quantitative	**Qualitative**
Strengths	Results from sample surveys can be generalised for entire population.	Open-ended questioning reveals new or unanticipated phenomena.
	Results can be aggregated and are comparable across population groups.	Provides a rich picture of social phenomena in their specific contexts – reveals critical incidents.
	Results can be broken down by socio-economic group for comparison.	Provides a holistic interpretation of the detailed processes that have and are shaping people's lives.
	Reliability of data and findings provide powerful indicators to guide policy.	Provides insights into intra-household relations and processes.
	Replicability - publication of questionnaires and dataset permits scrutiny of findings.	Provides deeper insights into causes and direction of causal processes.
	Transferability of dataset to other analysts means that analysis is not dependent on availability of an individual.	Permits researchers to access data on 'difficult issues' e.g. domestic violence.
	Precise professional or disciplinary minimum standards exist for much survey work.	Data on marginal groups that surveys often cannot locate can be collected e.g. illegal migrants, the homeless, child-headed households.
		Encourages creativity and innovative explanatory frameworks.

		Data analyst is usually heavily involved in data collection and knows its strengths/ weaknesses.
		Participatory methodologies empower, rather than objectify, respondents.
Weaknesses	Sacrifices potentially useful information through process of aggregation.	Difficult to demonstrate the scientific rigour of the data collection exercise.
	Sacrifices potentially useful data by placing households or events in discrete categories.	Low levels of standardisation and definitions/criteria and so on, vary from researcher to researcher.
	Neglects intra-household processes and outcomes.	Analytical methods are poorly specified and vary from researcher to researcher.
	Commonly under-reports on difficult issues, e.g. domestic violence.	Completion of research is often dependent on a single individual.
	Commonly under-reports on marginal/difficult to access individuals and households.	Often results cannot be generalised as it is unclear 'whom' they represent.
	Often wasteful in that large amounts of the dataset are never used.	Findings less likely to influence policy as they lack the legitimacy of science and the precision of numbers.
	Relatively expensive in terms of money.	Datasets are rarely made publicly available so that findings cannot be tested and other researchers cannot use the datasets.
	Poorly trained enumerators can make mistakes and inadvertently influence responses.	
	Enumerators may falsify/ invent data.	

Strengths and weaknesses quantitative and qualitative research methods (Adapted from Hulme, 2007).

H-6 Types of Case study

H-6.1 Descriptive case study

The descriptive case study is used to explore situations in which the intervention being evaluated has no clear, single set of outcomes (Yin, 2003). A descriptive approach is taken to portray an accurate profile of the events and situations (Yin, 2003). It explains a detailed analysis of a particular phenomenon and its context. The goal set by the researcher is to describe the data as they occur (Zainal, 2007). McDonough and McDonough (1997) suggest that descriptive case studies may be in a narrative form. The descriptive case study is about telling a story, including a discussion of what occurred and how people think about what occurred. However, exploratory study goes further than a descriptive study in trying to explain why events happened as they did or how particular outcomes occurred (Oates, 2006).

H-6.2 Explanatory case study

According to McDonough and McDonough (1997) explanatory case studies examine the data closely both at a surface and deep level in order to explain the phenomena in the data. Exploratory study also goes further than descriptive study in trying to explain why events happened (Oates, 2006). An explanatory approach seeks to establish causal relationships between variables and answer "how" and "why" questions (Yin, 2003).

H-6.3. Multiple Case studies

A multiple case study enables the researcher to explore differences within and between cases (Baxter and Jack, 2008). The goal is to replicate findings across cases. Since comparisons will be drawn, it is imperative that the cases are chosen carefully so that the researcher can predict similar results across cases or predict contrasting results based on a theory (Yin, 2003). The use of multiple case studies allows the researcher to search for cross-case patterns and themes to provide accurate and reliable theory and capture novel findings that may exist in the data (Eisenhardt, 1989; Miles and Huberman, 1994).

H-6.4 Intrinsic case study

Stake (1995) uses the term 'intrinsic' and suggests to researchers who have a genuine interest in the case, to use this approach when the intention is to better understand the case. It is not undertaken primarily because the case represents other cases or because it illustrates a particular

trait or problem but because, in all its particularity, the case itself is of interest (Baxter and Jack, 2008). The purpose is not to come to understand some abstract construct or generic phenomenon but rather to build theory, which is also an option (Stake, 1995). According to Baxter and Jack (2008), the intrinsic case study is used to accomplish something other than understanding a particular situation and provides insight into an issue or helps to refine a theory. The case is usually of secondary interest and plays a supportive role in facilitating the understanding of something else. Also, the case is often looked at in depth, its contexts scrutinised, its ordinary activities detailed, and it helps the researcher pursue the external interest (Baxter and Jack, 2008). Stake (1995) states that the case may or may not be seen as typical of other cases.

H-6.5 Collective case studies

Yin (2003) describes collective case studies as similar in nature and description to those of multiple case studies. The collective case study is an instrumental case study extended to several cases (Stake, 2003). In a collective case study the sample is purposive and the criteria for selecting cases should be to "maximize what we can learn" (Stake, 1995).

H-7 Characteristics of Qualitative Research

1. **Natural setting:** Qualitative researchers usually collect data in the field at the site where participants experience the issue or problem under study. The natural setting provides an opportunity for researchers to have face-to-face interaction over time.

2. **Researcher as key instrument:** Qualitative researchers typically gather multiple forms of data such as interviews, observations and documents, rather than relying on a single data source. Data are reviewed and organised into categories or themes that cut across all the data sources.

3. **Inductive data analysis:** Qualitative researchers often build their patterns, categories and themes from the "bottom up" by organising the data into increasingly more abstract units of information.

4. **Participants' meaning**: In the entire qualitative research process, the researcher keeps a focus on learning the meaning that the participants hold about the problem or issue, rather than the meaning the researchers bring to the research, or that of writers from the literature.

5. **Emergent design:** A qualitative research plan is emergent. This implies that the initial plan for research cannot be tightly prescribed and all the phases of the process could change after the researchers enter the field and start data collection.

6. **Theoretical lens:** Qualitative researchers regularly use a lens to view their studies, such as the concept of culture or ethnography. The study may sometimes be organised around identifying the social, political or historical context of the problem under study.

7. **Interpretive enquiry:** Qualitative research is a form of enquiry in which researchers make an interpretation of what they see, hear and understand which cannot be separated from their own background, history, context and prior understanding.

8. **Holistic account:** Qualitative researchers try to develop a complex picture of the problem or issue of study. This involves reporting multiple perspectives, identifying the many factors involved in a situation and generally sketching the larger picture that emerges. Researchers generally identify the complex interactions of factors in any situation (Creswell, 2007).

H-8 Components of Case study Research Design

Yin (2009) identifies five components of research design that are important for case studies:

- A study's questions
- Its propositions, if any
- Its unit(s) of analysis
- The logic linking the data to the propositions
- The criteria for interpreting the findings

The study's questions are most likely to be "how" and "why" questions and their definition is the first task of the researcher. The study's propositions are sometimes derived from the "how" and "why" questions and are helpful in focusing on the study's goals. However, not all studies need to have propositions. An exploratory study would have a stated purpose or criteria on which the success will be judged, rather than having propositions (Tellis, 1997), whereas, the unit of analysis usually defines the case. This could be groups, organisations or countries linking the data to propositions (Tellis, 1997). Yin (2009) states that the criteria for interpreting the findings are the least developed aspects in case studies. Nonetheless, Campbell (1975) describes "pattern-matching" as a useful technique for linking data to the propositions. Campbell (1975) also asserts that pattern-matching is a situation where several pieces of information from the same case may be related to some theoretical proposition.

H-9 Characteristics of Case studies

Oates (2006) has identified four major characteristics of case studies as listed below:

1. A focus on depth rather than breadth: the researcher obtains as much detail as possible about one instance of the phenomenon under investigation (Oates, 2006).

2. Natural setting: the instance or case is examined in its natural setting, not in a laboratory or other artificial situation. The case that existed prior to the researcher arriving at the scene normally continues to exist after the researcher has moved on (Oates, 2006).

3. Holistic study: the researcher focuses on the complexity of relationships and processes and identifies how they are interconnected and inter-related rather than trying to isolate individual factors (Oates, 2006).

4. Multiple sources and methods: the researcher uses a wide range of data sources. For example, if studying a department, a researcher will try to talk to as many people as possible about life and work in that department, rather than just one or two people to obtain multiple perceptions about the department and how it operates (Oates, 2006). Six types of case study are possible; these include: exploratory, descriptive, explanatory, multiple, intrinsic and collective case studies.

Appendix I – A Review of Some Existing Models, Frameworks and Theory

I-0 Introduction

Information and Communication Technology (ICT) is generally regarded as a tool that has significant effect on the productivity of firms (Oliveira and Martins, 2011) and a number of models have been proposed to explain the adoption of ICT. Thus, there is a need to identify some theoretical models, frameworks and theories that support ICT adoption. This section reviews a number of ICT adoption models that have been utitilised in the field of Information Systems (IS). Although there are many models/frameworks/theories in the field of IS (Wade 2009) however, a number of these are described in the subsequent section.

I-1 Overview of Adoption Models/Frameworks/Theory

This section provides an overview of some adoption models, frameworks and a theory for ICT adoption.

I-1.1 Technology Acceptance Model

The Technology Acceptance Model (TAM) was developed based on the idea that technology is readily available. Davis, et al. (1989) states that accepting or rejecting the model resides within the end user. Researchers (e.g. Pikkarainen et al. 2004, Davis et al. 1989, Mathieson 1991, Davis and Venkatesh 1996, Gefen and Straub, 2000 and Al-Gahtani 2001) describe TAM model as one of the most utilsed models in studying IS. The model is specifically tailored for modelling user acceptance of Information Technology (IT). According to Ma and Liu (2004), TAM proposes that perceived ease of use and perceived usefulness predict the acceptance of IT.

TAM originally originated from the Theory of Planned Behaviour (TPB) which originated from the Theory of Reasoned Action (TRA) in the field of psychology (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980; Mathieson et al., 2001).TAM was developed to study the decision-making processes of users as to whether or not to adopt IT in various settings. The goal of the model is to provide an explanation of the determinants of computer acceptance by tracing the impact of external factors on internal beliefs, attitudes and intentions (Davis et al. 1989).

Al rafi (2005) states that TAM is a model derived from a theory that addresses the issue of how users come to accept and use a technology. The model suggests that when users are presented with for example a new software package, a number of variables influence their decisions about

how and when they can use it. According to Al rafi (2005) TAM is considerably less general than TRA and is designed to be applied only to computer usage behaviour. However, Davis et al. (1989) state that it can be readily extended and applied to any other type of technology.

Algahtani and King (1999) further state that TAM is a valuable tool for predicting attitudes, satisfaction and usage from beliefs and external variables. Davis et al. (1989) identify key factors that are considered in TAM which include; Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). Perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance within an organisational context," and Perceived ease of Use is defined as "the degree to which the user expects the target system to be free of effort."

Al rafi (2005) notes that the theoretical importance of PU and PEOU as determinants of the user behaviour has been indicated in diverse lines of research. Although researchers have studied TAM from various perspectives however, many researchers have reported that the original TAM model did not incorporate external contextual variables that may be important predictors of perceived usefulness or perceived ease of use (deVreede, et al., 1999; Malhotra and Galletta, 1999; Mathieson et al., 2001).

Davis (1989) conducted numerous experiments to validate TAM by using PEOU and PU as two independent variables and, system usage as the dependent variable. He found that PU significantly correlated with both self-reported current usage and self-predicted future usage. PEOU also significantly correlated with current usage and future usage. Overall, PU had a significantly greater correlation with system usage than PEOU (Davis, 1989).

TAM has been tested widely with different samples in different situations and proved to be a valid and reliable model explaining information systems acceptance and use (e.g. Mathieson, 1991; Davis and Venkatesh, 1996 and Gefen and Straub, 2000). Gefen and Straub (2000) tested the applicability of TAM in e-Commerce adoption and found that PEOU and PU played a significant role in the use of websites for product browsing and purchasing. Nonetheless, Ma and Liu (2004) suggest that a further regression analysis suggested that PEOU might be an antecedent of PU rather than a direct determinant of system usage. In other words, PEOU affects technology acceptance indirectly through PU.

Many extensions of the original TAM have been proposed (e.g. Venkatesh and Speier, 1999; Venkatesh and Davis, 2000; Venkatesh et al., 2002; Henderson and Divett, 2003; Pikkarainen, 2004) although Bagozzi et al. (1992) state that TAM was later modified to make the model more contexts specific as a result of some constraints to system adoption. According to Bagozzi et al. (1992), the revised model captures the importance of the actual availability of technology and links it to perceptions of socioeconomic environment based on the on the importance placed by individuals.

I-1.2 Web Adoption Model

The web adoption model which was developed for firms in Singapore examines the characteristics of different levels of websites in terms of their features (Teo and Pian, 2004). The model comprises four levels which include:

Level 0 - No website, only e-mails account:

Teo et al. (1998) state that a firm is said to be in level 0 when it has not actually adopted the web. The authors classified internet adoption as: non-adopters which comprise of those without internet account, adopters without websites but with an internet account and, adopters with websites.

Level 1 - Web presence

Level 1 is referred to as web presence where firms have made their decision to adopt websites but the implementation is still in process (Shon and Wang, 1998 and 1999). The reason could be to occupy a domain name or simply to have internet presence. Teo and Pian (2003) note that websites at this stage provide information and brochures and tend to be non-strategic in nature.

Level 2 - Prospecting

This involves limited use of the internet. Usually, web adoption initiatives at this stage are spearheaded by individual departments. Thus, they are not tied to business strategy (Lee, 1999). Most firms at this level establish websites to provide customers with product information, news, events, interactive content, personalised content, e-mail support and so on. At this level, potential customers are given access to a firm's products with minimal distributing cost.

Level 3 - Business integration

At this level, web adoption is incorporated into a business model and the integration of the business processes takes place. This can enable cross functional links between customers and suppliers and web strategy can then be integrated with a company's business strategy (Teo and Pian, 2003).

Level 4 - Business transformation

Business transformation has been described by Teo and Pian (2003) as the highest level of web adoption. At this level there is usually a transformation of an organisation's overall business model and the organisation focuses more on building relationships and seeking new business opportunities.

I-1.3 Nolan's Stages of Growth Model

The Nolan stages of growth model is best known as the model of evolution that is related to organisational information systems and King and Kraemer (1984) describes it as the most widely cited model of computing evolution in organisations. The stages of growth model first emerged in the mid 1970s when researchers realised that IS had taken a special place in organisations and, it continued to grow and expand (Chan and Swatman, 2004). The model has been widely discussed and it is used for strategy development in organisations (Chan and Swatman, 2004). Mendo and Fitzgerald (2005) describe the model as a popular approach that explains the evolution and progression of internet technologies adoption and is commonly used to illustrate and conceptualise change in the growth and development of businesses. Benbasat et al. (1984) and Levy and Powell (2003) state that Nolan's stage hypothesis is well known in the IS literature but also controversial.

The 1973 version of the model comprises four stages which are: initiation, contagion, control and integration while the 1974 version translated the descriptive part of the 1973 model into a prescriptive tool to assist managers in dealing with computing growth. Ein-Dor and Segev (1978) state that the 1974 model was used to explain growth pattern and the future growth within the context of changes in inter-organisational and extra-organisational variable such as emergence of new technology and increased organisational sophistication in computing use. Furthermore, the 1974 version of the model focused its investigation on data-processing (DP) technology. It observed that expenditure on DP by different companies had a similar pattern called 'S-curve', which describes the pattern of learning and experience in IS implementation

(Nolan, 1977). In 1979, Nolan expanded the 1974 model to a more comprehensive six-stage model to include two new stages between control and maturity i.e. integration and data administration (Nolan, 1979, King and Kreamer, 1984).The model was later used in a study to describe organisations in terms of their relative positions on the growth scale. The various stages of Noan's 1979 model include:

Stage 1: **Initiation**

King and Kraemer (1984) describe the initiation stage as the stage where computing is introduced in an organisation to meet basic needs. Chan and Swatmanm (2004) state that technologies are used in an organisation for performing simple administrative functions such as automation of payroll or general ledger. Ward and Peppard (2002) also state that the initiation stage comprises batch processing to automate clerical operations in order to achieve cost reduction, pure operational systems focus and lack of management interest. The problems that mainly arise at this stage could be as a result of a company's role, that acts as a change agent and there is usually little management response to such problems. There is also the issue of decentralised control and minimal planning in the initiation stage (King and Kraemer, 1984).

Stage 2: **Contagion**

The learning curve moves up sharply at this stage as the use of technology becomes widespread and organisations, also become confident with the use of the technologies (Chan and Swatman, 2004). King and Kraemer (1984) and Ward and Peppard (2002) state that there is usually a rapid growth in computing use at this stage due to top management commitment to exploiting computing potential and high expectations among users, rapid rise in cost growth, centralisation and little increase in planning. Also, at this stage organisations generally begin to move to online systems.

Stage 3: **Control**

In the control stage, managers realise the need for controls due to rising expenditure, late delivery of projects and unsatisfied needs. According to Chan and Swatman (2004) users feel frustrated at this stage about the systems and management concerns such as cost. This is because projects relating to the systems are expected to show a return, plans are produced, and standards are enforced. Ward and Peppard (2002) advocate that the control stage often produces backlog of applications and users become dissatisfied. In addition, cost controls are instituted by top

management at this stage, planning is made a major priority, computing functions are centralised and programming standards are also established (King and Kraemer, 1984).

Stage 4: **Integration**

The integration stage is seen as an acceptance point where users start to accept a system and realise its benefits. At the end of this stage, users demand better control to provide more efficient systems (Chan and Swatman, 2004). Also, control is refined at this stage to allow exploitation of computing without running costs. In the integration stage planning is well established, users are more knowledgeable and capable of using computers. The operators of the systems are also more rational at this stage and economic analysis (e.g. cost benefit analysis) is mostly used to set priorities based on the new systems. In the integration stage, change systems are modified to ease restrictions on use and the systems are sometimes decentralised to user department to encourage improved systems developments (Chan and Swatman, 2004). Centralisation and decentralisation decisions are made in light of organisational and business strategy and, there tends to be a slow growth rate at this stage. Hence, Ward and Peppard (2002) describe the integration stage as a stage where there is considerable expenditure on integrating existing systems.

Stage 5: **Data Administration**

At this stage data administration is introduced to enhance the control of the systems. It is a stage where information requirements rather than processing drives the application portfolio. Information is usually shared within an organisation in the data administration stage. Database compatibility is usually explored and users try to understand the value of the information at this stage (Ward and Peppard, 2002).

Stage 6: **Maturity**

In the maturity stage, organisations begin to become confident in managing the technologies. An analysis of the experiences of a large number of companies using advanced data processing is carried out at this stage. During the control stage there is usually a transition of focus whereby, organisations shift from being very much involved with the management of the technology and move towards, the management of their total data resources including organisational restructuring and development of new management techniques. In other words, the first three stages focus on the technology itself and in the later stages attention is paid to the management of the technology (Chan and Swatman, 2004). According to Ward and Peppard (2002) the

planning and development of IS/IT in an organisation is closely coordinated, in the maturity stage.

Although Nolan's model is the most popular approach used for strategy development, however some authors have criticised the model, stating that it is yet to substantiate its claims to represent reality; either as a means to describe the transition phases in organisations when utilising ICT or as a predictor of change (Benbasat et al, 1984, King and Kraemer, 1984, Galliers and Sutherland, 1991). Nolan's model has also been criticised by Galliers and Sutherland (1991) of its inability to represent the reality of IS implementation or to predict forthcoming change (Benbasat et al., 1984). Galliers and Sutherland (1994) argue that the major weakness of this model is its focus on centralised database technology which according to a number of authors has little relevance for the current state of IS implementation. Furthermore, Galliers and Sutherland (1989 and 1991) and Galliers and Leidner (2003) state that Nolan's model is inadequate and lack organisational and management focus. According to Galliers et al. (1998) the major weakness of the early Nolan's models is related to its static nature. The authors note that the model only focused on identifying an organisation's degree of maturity with respect to IT rather than on the process through which an organisation progresses in order to achieve mature stages of growth.

King and Kraemer (in Ward and Peppard, 2002) conclude that the weakness and simplicity of Nolan's model may be the key to its popularity. Wiseman (1985) also states that up until 1983, Nolan's general purpose to IS was incomplete because the model offered no guidelines for identifying or explaining strategic IS opportunities. Similarly, Renken (2004) emphasises that the model offers no guidelines for identifying or explaining strategic IS opportunities. Layne and Lee (2001) and Daniel et al. (2002) argue that the model has not been empirically tested. According to Levy and Powell (2003) the model makes use of very simple versions of organisation change and innovation theory.

Mendo and Fitzgerald (2005) argue that the use of simplified linear approaches to analyse innovation fails to illustrate the complex processes that may take place at macro and micro-economic level within individual small firms. The authors state that the model assumes that companies' progress from basic to more advanced use of ICTs is in a linear fashion. The stage models in general have been accused of being concerned with the broad picture of change in the use of technologies by businesses rather than with the actual experiences of change in individual instances (Mendo and Fitzgerald, 2005).

Benbasat and Zmud (1999) affirm that despite the limitations and simplicity of Nolan's model it is still used by practioners. For example Chan and Swatman (2004), propose a staged model for business-to-business e-commerce implementation in Australian organisations. Quelch and Klein (1996) describe the model as a useful tool for SMEs because it can provide a roadmap to assist companies, determine whether or not it is sensible for a company to progress to a subsequent stage. Mendo and Fitzgerald (2005) also state that the approach is useful in explaining the past, current and future involvement in e-business. One of its major strengths is the sense of guidance and direction as to where to proceed further, as well as where an organisation might focus its goals and resources (Powell and Dimaggio, 1991). Finally, in using the stages approach, an organisation might reduce the complexity of their e-business initiatives, breaking them into smaller, more flexible and manageable portions. By so doing, an organisation is able to focus more on the task at hand, constantly evaluating and assessing the progression of their technology initiatives (Mendo and Fitzgerald, 2005).

I-1.4 Galliers and Sutherland Model

Galliers and Sutherland proposed a growth model in 1991, that was based on Pascale and Athos' 7Ss (1981) model in order to analyse organisational processes and management (Chan and Swatman, 2004). The empirical study was originally based on four western Australian organisations which was later refined during IS conferences and courses. The model is represented in six stages and each stage is associated with the seven Ss of Pascale and Athos: strategy, structure, systems, staff, style, skills and super-ordinate goals. Like the previous models, this model also describes the stages through which organisations can develop with the use of IT and IS and could provide indications as to how organisations should move from one stage to a more advanced stage (Chan and Swatman, 2004).

The revised stages model by Galliers and Sutherland (1991) expresses growth in IT maturity in organisations based on the six stages where each stage is associated with a particular set of organisational and management structure and also values. The model encapsulates a more pluralistic perspective on culture which accommodates sub-groups within a single organisation and also assumes a more purposeful approach to gaining understanding on how an organisation evolves with IT (Galliers et al, 1998). According to Chan and Swatman (2004) the advantage of Galliers and Sutherland's model lies in the case study-based method used in developing the model, which provides illustrations on how the model could be applied in real world environments. However, McKay et al. (2000) state that one major weakness of the model sterns

from its age. The authors state that the model was developed before the burgeoning of the internet, telecommunications technologies and the emergence of Internet Commerce (IC) and also, the increasingly interconnected world of electronic business.

I-1.5 Earl's Model (1989)

Earl's model concentrates on the stages through which organisations progress in planning their information systems. Earl argues that organisations will pass through a number of different learning processes with respect to IT and that different parts of a single organisation could be at different stages of growth with respect to a particular IT (Galliers and Sutherland, 1991, Galliers and Leidner, 2003). Earl's model was first described in 1983 and has been revised on a number of occasions (Earl, 1986, 1988 and 1989). Earl (1989) states that organisations begin their planning efforts by first attempting to assess the current state of play with respect to IS coverage and IT utilisation. Nonetheless, Galliers and Sutherland (1991) criticised Earl's model just like Nolan's model pointing out that Earl's model only places an organisation, at a certain stage in the growth process without actually suggesting how the organisation might move to a more mature stage. The following stages are suggested by Earl (2000):

Stage 1: **External Communication**

This involves creating a website whereby the main goals of a company is promotional and the website is rarely interactive. The website usually serves as a brochure for external communication without interaction with the internet (Ghachem, 2006).

Stage 2: **Internal Communication**

At this stage, companies begin to introduce intranet using web and internet technologies. Also at this stage, information technologies are deployed to facilitate the use of and access to certain systems within the organisation and to prepare for the future integration of electronic commerce (Ghachem, 2006).

Stage 3: **Electronic Commerce**

This stage includes the use of the internet for the sale of goods and services rather than just as a means of communication. Ghachem (2006) states that internet is adopted as a new distribution channel to complement the other traditional channels at this stage.

Stage 4: **Electronic Business**

During this stage the company effort is focused on the construction of new business models that are suitable for the new economy through adjustments and reengineering of the business process (Ghachem, 2006).

Stage 5: **E-Enterprise**

In this stage, organisations redefine the way the process is managed in order to stay in tune with the new business process. Ghachem (2006) states that a new conception of the organisation emerges at this stage with new information technologies that render decision making possible in real time.

Stage 6: **Transformation**

Finally, arriving at this stage of maturity implies that a company has successfully accomplished the different adoption phases of electronic business (Ghachem, 2006). At this stage the company involved, accepts the challenges of the previous stages and incorporates new business and management models that are required by the new economy (Ghachem, 2006).

I-1.6 Hirschheim Model (1988)

This model originates from a research that was conducted in 1986 which investigated the evolution and management of IT function in a number of British organisations (Galliers and Sutherland, 1991, Galliers and Leidner, 2003). The model is built on the earlier work of Nolan 1979 model. Hirschheim argues that when a company's top management begins to realise the importance of IS to their business, they progress through three evolutionary phases in their management of IS/IT function. These phases include:

1. **Delivery phase**:

In this phase a company's top management is concerned about the ability of the IS/IT function to deliver the expected outcome. Although senior executives start to take the subject of IS/IT very seriously in this phase, however there is often dissatisfaction with the quality of available information systems and the efficiency of the IS/IT function (Galliers and Sutherland, 1991, Galliers and Leidner, 2003). There are usually concerns regarding IT expenditure and the consistency of hardware and infrastructure policies in this phase.

2. **Re-orientation phase**:

A company's top management changes the focus of attention from delivery of basic IS services to the exploitation of IT for competitive advantage in the re-orientation phase. An attempt is made to align IS/IT investment with business strategy and it is in this phase that a business is put into computing (Galliers and Sutherland, 1991, Galliers and Leidner 2003).

3. **Re-organisation phase**:

In the re-organisation phase, senior IS executives are concerned about managing relationships between IS functions and the remaining part of the organisation. In most cases some areas of a company will be strategically dependent on IS while others will be looking more to IS in support of their role. Galliers and Sutherland (1991) and Galliers and Leidner (2003) state that some areas in a company will have significant IT capability particularly with the advances of end-user computing and some business executives will then be involved in driving IS and IT development.

I-1.7 SOGe Model

The original and provisional SOGe model (McKay et al., 2000) was based on Galliers and Sutherland's stage model for IS/IT development (Galliers and Sutherland, 1994). The SOGe model retains the Galliers and Sutherlands (1994) notion that an organisation could be at different levels of maturity (Prananto et al., 2002). The model is an integrated model of electronic business maturity that was achieved as a result of mapping an Internet Commerce (IC) model onto the Galliers and Sutherland model thus it is referred to as 'SOGe model' (Stages of Growth for e-business). The SOGe model retains the six stages of the Galliers and Sutherland model, but adds a six stage IC maturity model that describes maturity in terms of IC (McKay et al., 2000). As with all other stages of growth models, the SOGe model assumes that a normal progression over time is from a less mature to increasing sophistication. The SOGe model is made up of the following stages:

Stage 1: **No presence**

Organisations at this stage may be criticised as adopting a "wait and see" approach. The strategy adopted by organisations at this stage is to wait for competitors or business associates to go online, assess their results and then act when business benefits and profits accrue from the IC investment (McKay et al., 2000). Marshall et al.(1999) state that this stage is associated with uncertainty about the cost and benefits of IC, issues of risk and security associated with IC and

uncertainty as to whether an organisation's goods or services are suitable for advertising and sale over the internet.

Stage 2: **Experimental online presence**

At this stage, the organisation establishes an initial presence of the internet however this is limited to a state. Information is provided only where information dissemination and communication is essentially required from the organisation by interested parties (McKay et al., 2000). Berryman (1999) states that information published online at this stage may take the form of corporate brochures, products/service information and catalogues, information for shareholders, job opportunities with the organisation and so on. This is regarded as an essential stage for experimenting, learning and building organisational commitment (McKay et al., 2000).

Stages 3: **Interactive online presence**:

This stage is described as the first stage where organisations enter into a two-way communication and the interaction with customers on the internet. Internet channel such as email, browsers and databases help to provide information as required to customers, and may also assist in gathering information and feedback from custmers (McKay et al., 2000).

Stage 4: **Internet Commerce**

The internet commerce stage marks a fundamental change in business activity as organisations are able to complete transactions over the internet (McKay et al., 2000). Thus online inquiries, orders, payments and other services are provided interactively using the internet as a medium to carry out the transaction. It would also be expected at this stage that IC activity begins and move on to organisational structures and processes after which, changes will be necessitated to accommodate new methods of transacting business (McKay et al., 2000).

Stage 5: **Internal integration**

Organisations at this stage begin to integrate their front office internet transaction capabilities and accompanying technologies with their back office, IS/IT business support systems and technologies (McKay et al., 2000). Premkumar (1994) states that organisations are concerned about the need to align IS/IT investment with business strategies at this stage. Also, processes and structure may be reengineered to accumulate the benefits of modern technologies. McKay et al. (2000) state that activities between IC trading and traditional trading discontinues as organisations achieve better level of integration across all the IS/IT investments. Therefore, IC

may act as a catalyst to remove duplicated efforts and mainly integrate intra-organisational IS/IT investments and initiatives (McKay et al., 2000).

Stage 6: **External integration**

IT plays a key role in transforming the entire business network at this stage. It brings about an extension of traditional organisational boundaries, giving rise to notions such as the extended enterprise (McKay et al., 2000) and virtual organisation (Marshall et al., 1999). Evident at this stage is the integration of business processes and technologies of networks involving buyers and sellers that can result to mutual relationships between trading partners (McKay et al., 2000).

Like the Galliers and Sutherland model, the SOGe model suggests that organisations may "jump" over levels (but assumes that in one way or another, they have acquired the skills of the "missed" level) and that extreme circumstances and failure may cause an organisation to regress along one or both of the aims of the model (Prananto et al., 2002). The SOGe model is a useful analytical tool which helps specialists to understand and describe a company's position with regard to electronic business, including its degree of maturity pertaining information technologies and systems. The SOGe model allows for different levels of maturity within an organisation comprising of those that are specific to traditional systems and technologies and those that concern only the internet. The different phases of the model help organisations to evaluate their current position and plan their future strategies for electronic business. Prananto et al. (2004) state that the model helps to understand and study the different forces and barriers, to the implementation of electronic business at each maturity stage.

I-1.8 Rao Model

Rao et al. (2003) maintain that it is beneficial to have a maturity model that describes a logical evolution of electronic commerce at various stages of development. The authors proposed a model that is composed of four phases: presence, portal, transaction and total integration (Ghachem, 2006). They argue that cost, technology demand and complexity increases progressively during the last phases of the model. Rao et al. (2003) note that the model does not require a company to progressively accomplish each stage successfully but rather allows a company to begin within any phase skipping certain stages of the model. According to the authors, a company that is increasingly aware of the importance of information technology and electronic commerce could begin with a later maturity phase, bypassing the others, in order to

accelerate its development process in electronic commerce (Rao et al., 2003 and Ghachem, 2006). The model includes the following stages:

Stage 1: **Presence**

During this first maturity phase, the online presence of a company consists of an information website with one way communication as there is no intention to receive information from the internet (Ghachem, 2006). The website serves as a virtual company brochure showing its products and services (Timmers, 2000) and some general information. The internet presence at this stage is mainly used to attract new clients and does not include any internal or external company process.

Stage 2: **Portals**

Unlike the first phase, this phase includes two way communications (Ghachem, 2006). With an informational website, clients and suppliers can make offers, send comments on the products or services and participate in online surveys. Also in this stage, a company endeavours to gather information about each visit to the website in order to better understand the profile (Ghachem, 2006).

Stage 3: **Transaction integration**

This phase allows for online financial transactions involving the buying and selling of goods and services. It implies high structural and technical abilities, and the company can create virtual communities that allow clients to share information based on common interests. Also, the transactional website can offer a platform for electronic auctions or a virtual business marketplace for buyers and sellers (Ghachem, 2006). However, the level of cooperation between partners at this stage is described by Ghachem (2006) as low.

Stage 4: **Company integration**

The company integration stage is described as the advanced stage where web technologies are perfectly integrated at the level of an organisation's internal and external processes. At this stage, the electronic commerce systems are used to manage a company's dealings with clients. There is usually an intensive partnership between clients and suppliers in this stage (Ghachem, 2006).

I-1.9 Kapurubandara and Lawson's Framework

The Kapurubandara and Lawson's (2006) framework considers barriers to ICT and e-commerce adoption within SMEs in Sri Lanka by identifying significant factors that affect the adoption process. The identified factors which are grouped into two broad categories: Internal and External barriers are described below.

1. **Internal Barriers**

Internal barriers as described by the authors are barriers that are within SMEs control i.e. barriers that can be overcome by SMEs. For example, the lack of time or resources and the lack of awareness on the part of the owner/manager. Kapurubandara and Lawson (2006) further categorised internal barriers into: individual barriers, organisational barriers and barriers relating to cost and the return on investment.

2. **External Barriers**

External barriers are described by Kapurubandara and Lawson (2006) as those barriers that cannot be resolved by SMEs. These are barriers that SMEs have no control over hence SMEs are compelled to work within the constraints for example, inadequate telecommunications infrastructure. The authors further divided external barriers into sub-categories which include: infrastructure related, political, social and cultural and also legal. Kapurubandara and Lawson (2006) state that some of the external barriers could be addressed by clustering, sharing expenses, resources and facilities and they further recommend that SMEs should work together, irrespective of the industry sector.

I-1.10 Technology, Organisation and Environment Framework (TOE)

The TOE framework was developed in 1990 by Tornatzky and Fleischer (1990). The framewok identifies three contexts in an organisation which, influence the process by which a company adopts and implements a technological innovation. A synopsis of the technological, organisational and environmental contexts is given below.

1. **Technological context**

The technological context describes both the internal and external technologies that are relevant to the firm. It includes current practices and equipment internal to the firm (Starbuck 1976) and also, the set of available technologies external to the firm (Thompson 1967, Khandwalla 1970, Hage 1980).

2. **Organisational context**

The organisational context simply refers to descriptive measures about the organisation such as scope, size, and managerial structure (Tornatzky and Fleischer, 1990).

3. **Environmental context**

The environmental context is the arena in which a firm conducts its business. The environmental context considers issues relating to the industry, competitors and the government (Tornatzky and Fleischer, 1990).

I-1.11 Rogers' Innovation Diffusion Theory

The Rogers' innovation diffusion theory is described as the most frequently cited theory in most research that is based on diffusion of innovation (van Akkeren and Cavaye, 1999; Gregor and Jones, 2000; Kendall et al., 2001). Premkumar and Roberts (1998) state that Rogers' theory is useful because it attempts to explain not only the factors that influence the adoption of an innovation but also the manners in which new innovations are disseminated through social systems over time. Rogers defines diffusion as the process by which an innovation is communicated through certain channels over time among the members of a social system (Rogers, 1983). Innovation is defined as any idea, practice or object that is perceived to be new by an individual (Looi, 2004). Five innovation characteristics are defined by Rogers which include:

1. **Relative advantage**

Relative advantage is defined as the degree to which an innovation is perceived as being superior to its predecessor in terms of economic profitability, low initial cost and a decrease in discomfort, savings in time and effort, and in the immediacy of the reward.

2. **Compatibility**

Compatibility is defined as the degree to which an innovation is perceived to be compatible with existing beliefs, experiences and needs of potential adopters.

3. **Complexity**

Complexity is the degree to which an innovation is perceived to be relatively difficult to understand and use. The perceived complexity of an innovation is negatively related to its rate of adoption.

4. **Trialability**

Trialability is the degree to which an innovation can be used on a trial basis before the confirmation of the adoption must occur. Rogers (1995) found that "the trialability of an innovation as perceived by members of a social system is positively related to its rate of adoption".

5. **Observability**

Observability is defined as the degree to which the potential adopter perceives that the results of an innovation are visible to others.

Rogers (1995) states that a technological innovation will diffuse faster if it is perceived as having the five attributes of innovation. According to Looi (2005), these five attributes represent the main determinants that explain 49 to 87% of the variance in the rate of adoption. Rogers (1983) states that displaying an innovation's superiority in a tangible form helps to increase the adoption rate. Also, faster rate of adoption occurs when an adopter perceives an innovation as meeting the needs of clients. The author notes that many change agencies offer incentives or subsidies to clients, in order to speed the rate of adoption in innovations.

I-1.12 Summary

The brief review of the models, frameworks and theory indicate that the effective use of ICT can help to create strategic advantages in SMEs. Nolan's model for example provides information on how the internet can be used as a tool for increasing competitiveness in organisations. The model suggests a linear framework whereby, an enterprise could develop its ICT function from a low level of ICT usage to a high degree. Nevertheless, the model has been criticised by a number of researchers. Earl (1989), Hirscheim et al. (1988) and Galliers and Sutherland (1991) models suggest that the development IS/IT occur as a result of maturity in the various stages of growth. Earl's model describes the tasks involved in planning at each stage, the implementaion of a new system. Earl's model recognised the need for strategic planning at every level within an organisation. While Rao et al's model for instance, considers the logical evolution involved in the development of electronic commerce in an organisation. Furthermore, the TAM model lays emphasis on IT adoption, implementation and diffusion in terms of perceived ease of use and usefulness which, can be based on the intentions of the decision maker. Whereas, Rogers' Innovation Diffusion theory considers diffusion of innovation, explaining the ways in which new innovations are disseminated through social systems over time. There was also a discussion on

the Web model which confirms that the adoption of the internet can transform an organisation's overall business model. Again, a review on Kapurubandara and Lawson's framework confirms that internal and external barriers affect the adoption of e-commerce in SMEs. While the TOE framework, identifies three aspects in an organisations that can influence the adoption and implementation of technological innovations.

I-1.13 Appendix I - References

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Appendix J – Regulatory Bodies in Nigeria

In Nigeria, there are a number of regulatory bodies that handle telecommunication matters, some of which are highlighted below.

J-1.1 National Information Technology Development Agency (NITDA)

The National Information Technology Development Agency (NITDA) was set up by the Federal Government of Nigeria in April 2001, to ensure the implementation of the National Information Technology Policy and to coordinate the development and regulation of the Information Technology Sector (Ajayi, 2003). NITDA's mandate is diverse and vast, but all its responsibilities fall under the auspices of fostering the development and growth of IT/ICT in the country (Arikpo et al., 2009). After its establishment, NITDA embarked on a number of projects thereby assisting in the development of IT/ICT in Nigeria. NITDA also regulates, monitors, evaluates, and verifies progress of these projects under the supervision and coordination of the Federal Ministry of Science and Technology in an effort to ensure that the implementation of the IT policy proceeds with maximum effectiveness (Arikpo, 2009). According to Ajayi (2003), NITDA has played a major role in trying to integrate IT into the public service via some enlightenment campaign programmes that were targeted at the top level of the service.

J-1.2 Nigerian Communications Commission (NCC)

The Nigerian Communications Commission is an independent National Regulatory Authority for the telecommunications industry in Nigeria. The commission was established in 1992 and is responsible for creating an enabling environment for competition among operators in the industry, as well as ensuring the provision of qualitative and efficient telecommunications services throughout the country. NCC has a mission to support a market driven telecommunications industry and promote universal access through consistent enforcement of clear and fair policies that protect stakeholders, ensure efficient resource management, share industry best practices and deliver affordable, quality telecom services. The Commission's vision is to create an information rich environment that can compete globally in the area of quality telecom services and is regulated by a responsive, world-class organisation (NCC, 2011).

J-1.3 Nigerian Internet Group (NIG)

This is a non-governmental organisation (NGO) that was founded in 1995 and is dedicated to the promotion and growth of the internet in Nigeria. The group engages in a number of activities which include policy advocacy, awareness creation and education. The awareness creation and

education tasks of the group are carried out through conferences, seminars, exhibitions, workshops and newsletter publication, while policy advocacy is done by actively engaging the government during and after policy formulation processes. The activities of the group have led to a tremendous increase in awareness about the internet within Nigeria which has further led to an increased level of internet connectivity in the country (www.nigeriainternetgroup.org). The group's objectives are to promote the internet as a tool for personal and national development, to promote the provision of internet access for all Nigerians, to sensitise the government and the general public to the potentials of the internet as a critical tool for economic development, to promote the development of local internet content through the adoption of online services such as e-Government, e-Health, e-Learning, e-Commerce, e-Entertainment and so on, to promote the formulation of appropriate policies and legislations that ensure the growth and development of the internet in Nigeria and finally, to promote the creation and adoption of appropriate standards and ensure compliance to such standards. Membership includes academia, NGOs, government officials, internet service providers, private organisations and individuals (NIG, 2011).

J-1.4 Computer Professional Registration Council of Nigeria (CPN)

The Computer Professional Registration Council of Nigeria (CPN) was established in 1993 with the core responsibility of advancing within Nigeria the knowledge of computer science and the use of computational machinery and techniques related thereto (Arikpo et al., 2009). The duties of CPN include: to determine what standards of knowledge and skills are to be attained by persons seeking to become members of the computing profession and improving those standards from time to time as circumstances may permit; and to secure in accordance with the provision of the decree, the establishment and maintenance of a register of persons seeking to be registered under the decree to practice in the computing profession. Other duties of CPN include, control and supervision of computing practice in Nigeria and screening of corporate bodies seeking to be registered to engage in the sale or use of computing facilities. Also, this organisation is responsible for ensuring highly professional computing ethics and professionalism, accreditation of institutions' courses and programmes, conducting professional examinations in computing and liaising with associations or bodies external to the council (CPN, 2011).

J-1.5 Federal Ministry of Science and Technology (FMST)

The Federal Ministry of Science and Technology (FMST) is responsible for co-ordinating the disparate efforts of using technology for development in a wide array of sectors such as education, medicine, agriculture and communications (Jidaw.com, 2007). The focal vision of the

FMST is to make Nigeria, in the near future, an acknowledged member of the fast developing scientific and technologically progressive nations of the world and to be Africa's leader in scientific and technological development. The Ministry's mission is to chart the course of scientific and technological development in the nation by keeping abreast of the latest progress in research and development (R&D) in science and technology, ensuring that various research and development efforts of public science and technology establishments fit in with the overall development plan of the nation, advising government on science and technology policy matters and implementing those policies to facilitate the contribution of science and technology to socio-economic progress and the security of the nation (FMST, 2011).

J-1.6 Nigerian Computer Society (NCS)

The Nigerian Computer Society (NCS) is a Society for Nigerians around the world in the Information Technology industry, from students to professionals. The aims of the Society, amongst others, are to bring together Nigerians around the globe working or interested in computer technology and to promote computer and internet technologies within Nigeria. NCS promotes forums for technology development and utilisation in Nigeria and helps businesses and government agencies to better understand the benefits of current technologies and prepare for future advances. It provides an independent forum for discussion on the provision and implementation of a robust, scalable and secure internet infrastructure in Nigeria and also supports and encourages the adoption and effective utilisation of ICT. Furthermore, NCS provides an online learning and development knowledge base that is accessible to all Nigerians and ensure all Nigerians within the country have access to computers and the internet (NCS, 2011; Arikpo et al., 2009).

Apart from the regulatory bodies, there exists an Internet Service Providers' Association of Nigeria (ISPAN) that aims to determine the needs of end-users in Nigeria on an on-going basis, serves as a source of repository of relevant information for its members and the general public, influences industry regulation in Nigeria concerning structures, policies, tariffs and competition, supports and promotes the implementation of regulated competition in the ISP industry, promotes staff development and training of members and extends internet services to disadvantaged communities in Nigeria (ISPAN, 2011; Adomi, 2005).

Subsequently, some developmental programmes have been put in place to assist in the development of ICT in Nigeria. For example, the National Communication Commission (NCC)

has made efforts to improve the Nigerian telecommunications infrastructure: ensuring that ICT is given a high priority in all sectors of government, access is affordable, decreasing the duty rate of telecommunication products, encouraging operators to improve transmission infrastructure across the country, opening up discussion with operating companies on how to reduce bandwidth charges in the country, expanding subscribers' base in the fixed services area by moving towards market consolidation, reducing regulatory pressures and also demanding a better utilisation of resources amongst others (Ndukwe, 2004). However, there are still several factors inhibiting Nigeria's telecom development. NCC also launched the Digital Institute in order to provide training in the area of ICT to organisations and individuals that is tailored to meet their specific needs. The curriculum was designed to meet international standards so that products of the Institute can compete favourably in any part of the world (Hamza, 2006).

Also, the Federal Government of Nigeria initiated a development programme called Computer for All Nigerian Initiatives (CANI) through the Federal Ministry of Science and Technology and the National Information Technology Development Agency (NITDA) in collaboration with stakeholders such as the Intel Corporation, Microsoft, the Original Equipment Manufacturers (OEMs) and some financial institutions, as an integral component of the ICT diffusion strategy. The programme was designed to assist individuals to own computer PCs/Laptops at discounted rates under attractive and convenient repayment schedules. The objectives of the programme are to expand the usage of computers and IT within Nigeria, build a computer literate workforce, stimulate the development of a vibrant Personal Computer (PC) hardware and software industry in Nigeria and also to achieve the millennium development ICT goals (Balancing Act, 2011). The first phase of the programme commenced in 2006 with two indigenous companies, namely Omatek Computers Limited and Zinox Technologies, mainly engaged in supplying 14,500 computers to individuals. So far, the first phase has been concluded while modalities for the take-off of the second phase are under consideration and are intending to involve other public institutions such as Universities, Polytechnics and Colleges of Education, the Military and other para-military institutions and the general public.

Other development programmes include the establishment of Rural Information Technology Centres (RITC) in the under-served communities in 774 Local Government Areas (LGAs) which is being carried out in phases by NITDA. There is also, the establishment of National Information Technology Parks (NITP) with active partnership with State governments and the private sector as well as the provision of the Mobile Internet Unit (MIU) which is an excellent

tool for human capacity building at a rural level. Furthermore, there is the establishment of the National Information Communication and Education Programme (NICEP) which provides e-learning infrastructural platforms and the establishment of e-government strategies that drive the computerisation of all Government operations (Hamza, 2006).

In addition, there is the Nigerian American Information Initiative (NAII) programme and the Education for Development and Democracy Initiative (EDDI) funded by the American Government under the State Department, which is responsible for bridging the existing digital divide. These initiatives also provide grants to some organisations in Nigeria that facilitate different levels of information access in their communities. Some of the organisations have trained several hundred Nigerians and have equipped them with IT skills ranging from the ability to use and access information using a computer, to developing skills in the use of online resources (Hamza, 2006).

Nigeria desires to use ICT as a major driving force for re-engineering and rapidly transforming the interface of the needs of its citizenry by establishing a Government Wide Information System (GWIS) at National, State and local levels and also replace traditional governance with electronic governance. This is to create a knowledge based and Simple Moral Accountable Response and Transparent (SMART) governance, reduce bureaucracy, maximise profitability and quality, eliminate waste, increase efficiency, create an easy and free access to government information and also reduce the cost of service delivery (NITDA, 2001).

J-1.7 Appendix J – References

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Appendix K - Personal Reflection

The 39 months of the PhD research has been an intense learning period which has changed my attitude and personal life. There was always so much to do in a short time and it seemed to be a task that would never end. The research journey has taught me how to conduct independent study and has also stretched my intellectual capabilities. There are many things I have learnt along this thesis writing journey which include effective thesis management and scholarly writing. With the support from my supervisors, I now have a better understanding of the research process, building arguments, and writing academic reports. Overall, I have learnt valuable life lessons from the PhD process. Although I was faced with several physical, psychological, and emotional challenges, there were some good experiences especially with respect to further developing my intellectual capability.